USER MANUAL

PA-6322

15" POS Terminal

Powered By Intel® Celeron®

J1900 Quad-Core

PA-6322 M2

PA-6322 POS System

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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 may occur when the battery is incorrectly replaced. Replace the battery 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. We strongly recommend that only qualified engineers are allowed to open and disassemble the system. Please operate the LCD and Touchscreen with extra care as they can be broken easily.

Contents

List of Figures

Revision History

The revision history of PA-6322 User Manual is described below:

Version No.	Revision History	Page No.	Date
M1	Initial Release	-	2017/04/24
M2	● Revised Section **3.2.2 VFD: MB-4103 (RS-232)**.	3-63 to 3-72	2018/01/31
	● Revised OPOS driver in section **3.2.3 MSR: MB-3102 (PS/2)**.	3-73 to 3-79	

1 Introduction

This chapter gives you the information for the PA-6322. It also outlines the system specifications.

The following topics are included:

- About This Manual
- POS System Diagrams
- System Specifications
- Safety Precautions

Experienced users can go to Chapter 2 for a quick start.

1.1   About This Manual

Thank you for purchasing our PA-6322 Series System. The PA-6322 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-6322 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 motherboard, printer, VFD, MSR components and their function. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 3 Software

This chapter contains detailed information for driver installations of the Intel® Utility, VG, LAN, Sound, Touch Screen, embedded peripheral devices, BIOS setup & update, Watchdog timer and resource map.

Appendix A System Diagrams

This chapter shows the exploded diagrams and part numbers of PA-6322 components.

1.2 POS System Diagrams

Unit: mm

1.2.1 Panel PC
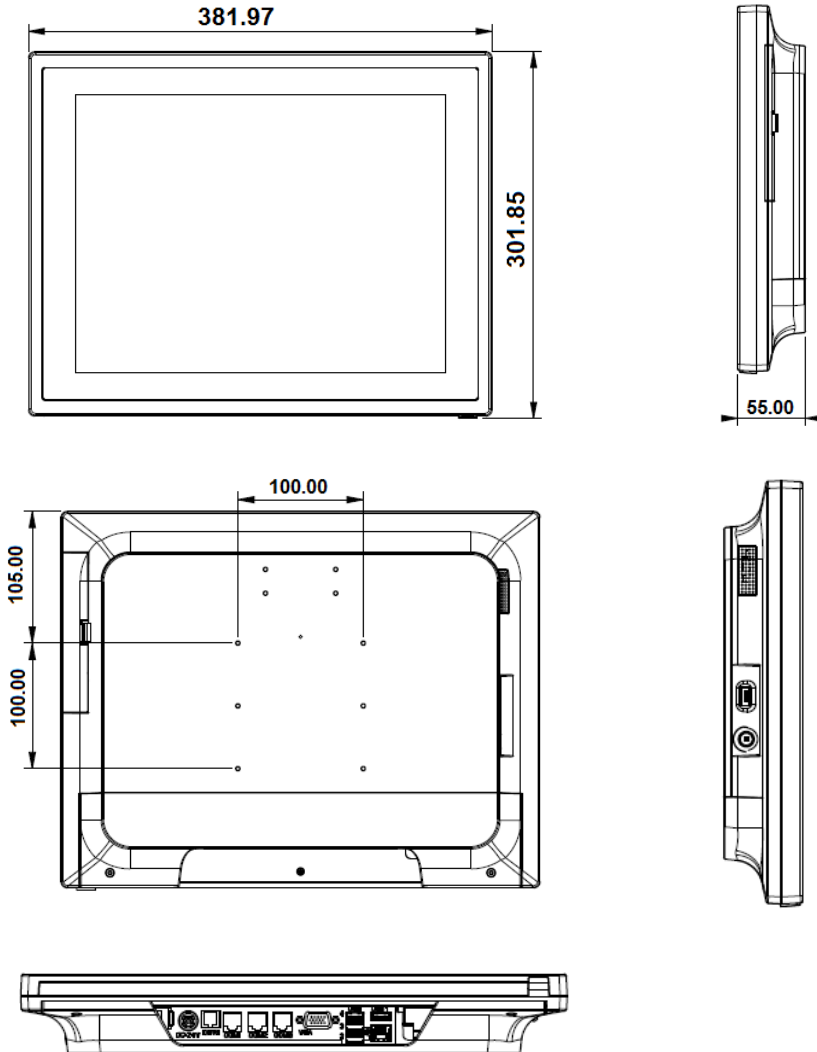
1.2.2 Easy Stand
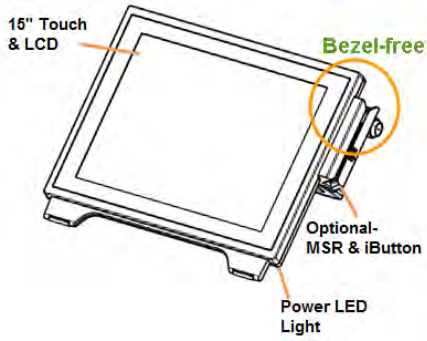
Bezel-free TouchScreen

Adjustable angle 30-50 degree
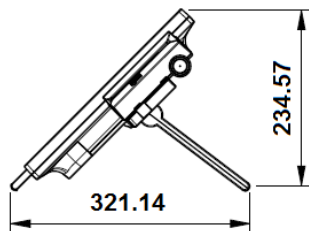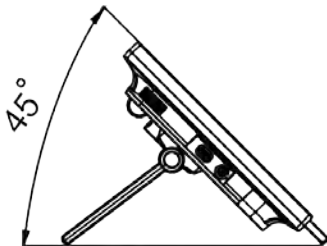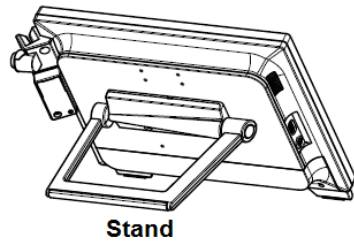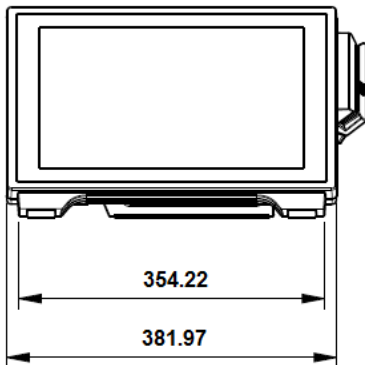
1.2.3 Normal Stand
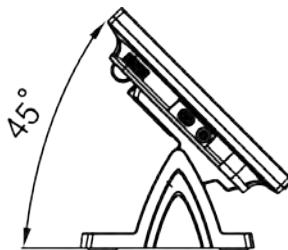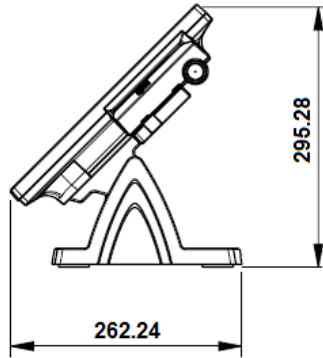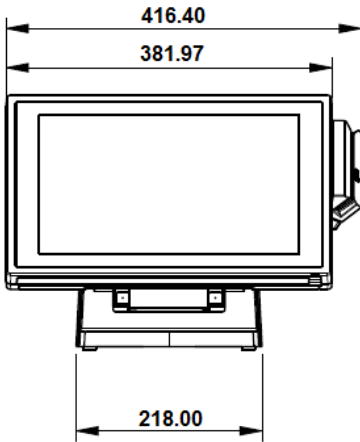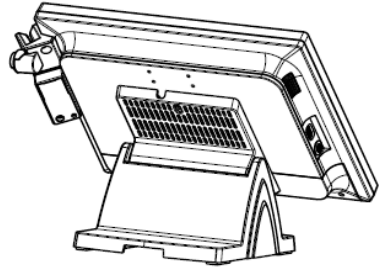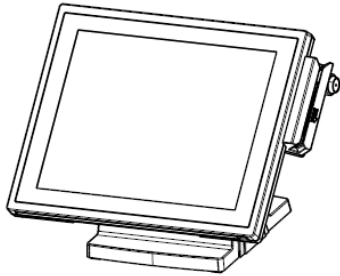
1.2.4 PRINTER Stand

Unit: mm
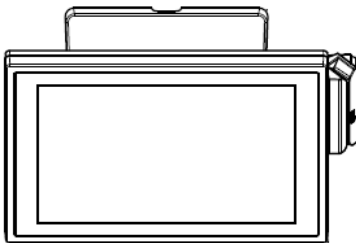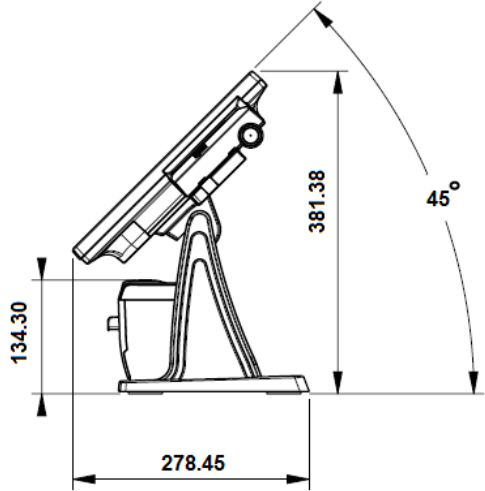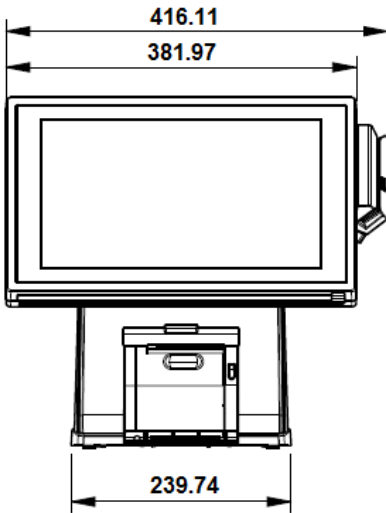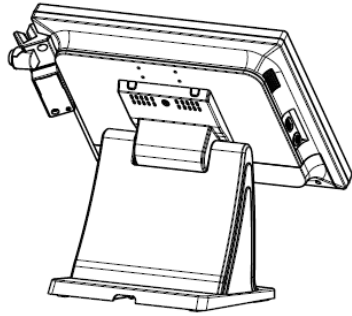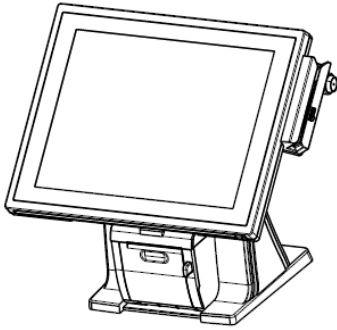
Caution:

Please refer to the picture below to close the printer door properly.
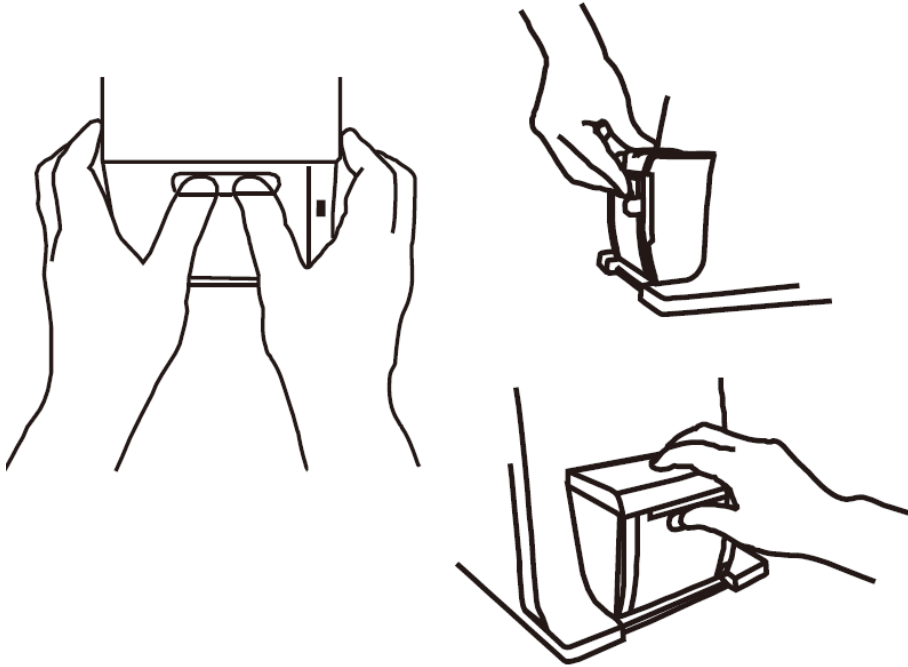
1.3   System Specifications

System

CPU Support	Intel® Celeron® J1900 Quad-Core 2.0GHz
Memory	1 x DDR3L SO-DIMM 204-pin socket, up to 8GB
Network	10/100/1000Mbps Base-T Fast Ethernet
OS Support	• Windows Embedded 8 Industry Pro Retail • Windows Embedded POSReady7
Audio	2W speaker
BIOS	AMI SPI BIOS, 8 Mbits with VGA BIOS
RTC Accuracy	3 days ± 3 seconds
System Weight	Easy stand with power adaptor approx. 6 kg
Dimension (W x H x D)	• 382mm x 234mm x 321mm (with 45 degree) for Easy Stand type • 382mm x 295mm x 262mm (with 45 degree) for Normal Stand type • 382mm x 381mm x 278 mm (with 45 degree) for Printer Stand type

Power Consumption (AC): Power Supply: 60-90 Watt power adapter

System Status	OFF	IDLE	WORKING	
			w/o Printer	With Printer
Burn-in Test loading Set/CPU/HDD/ Memory	Shut down	Standby	100%	
USB	-	-	5V x4 ports with dummy	
COM	-	-	5V x2 ports with dummy 5V x1 ports with dummy	
For Printer	-	-	-	With 24V/1.2A printer running
Power Consumption	AC 1W	AC 20.3W	AC 56.3W	AC 89.6W

EMC & Safety Certificate: CE, CE-LVD, FCC

Type	Standard	Description
EMI	EN 55022 Class A	-
EMS	EN 55024	-
IEC 61000-4-2	ESD	• 8kV air discharge • 4kV contact discharge
IEC 61000-4-3	RS	80~1000MHz, 3V/m, 80% AM(1kHz)
IEC 61000-4-4	EFT	• AC Power Port: 1kV • DC Power Port: 0.5kV • Signal Ports & Telecommunication Ports: 0.5kV
IEC 61000-4-5	Surge	• AC Power Port: Line to line: 1kV Line to earth(GND): 2kV • DC Power Port: Line to earth(GND): 0.5kV • Signal and Telecommunication Port: Line to GND: 1kV
IEC 61000-4-6	CS	0.15~80MHz, 3Vrms, 80% AM, 1kHz
IEC 61000-4-8	PFMF	50Hz, 1A/m
IEC 61000-4-11	Voltage Dips	• > 95% reduction for 0.5 periods • 30% reduction for 25 periods
	Voltage Interruptions	> 95% reduction for 250 periods
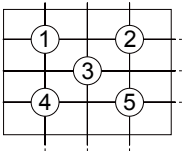
Storage

SATA	1 x 2.5"HDD or SSD

I/O Ports

USB	On rear: • 3 x USB 2.0 • 1 x USB 3.0 On side bezel: • 1 x USB 2.0
Serial Ports	3 +1 (optional) x RJ45 (all support +5V/12V selectable)
LAN	1 x RJ45
VGA	1 x DB15
Cash Drawer	1 + 1 (option, with Y cable) x RJ11 (12V or +24V selectable)
DC-In	1 x4pin DC Power Jack

Display
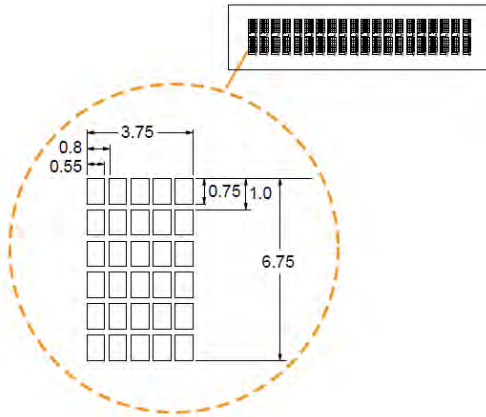
15" TFT XGA LCD	Max. Resolution: 1024 x 768 Signal Interface: TTL (24-bit)
Touchscreen	Non-Bezel-free: ・ 5-wire Analog resistive Bezel-free: ・ 5-wire Analog resistive or Projected Capacitive
Brightness 	・ Resistive Touchscreen: Minimum 160 cd/m^2 ・ Projected Capacitive Touchscreen: Minimum 180 cd/m^2
Tilt Angle	・ 45-65 degree with easy stand ・ 0-68 degree with normal stand ・ 0-50 degree with printer stand

Environment

Temperature	・ Operating: 0°C ~35°C (32°F ~ 95°F) ・ Storage: -5°C ~60°C (-27°F ~ 140°F)
Humidity	20%~90%

Optional Accessories

Printer	2" or 3" easy loading thermal printer with Auto cutter
MSR & iButton	JIS-I or II, ISO Track1+2+3 (PS/2 interface)
2nd Display	・ 8" LCD (Resolution: 800 x 600) ・ 10.4" LCD (Resolution: 1024 x 768 or 800 x 600)
Customer Display	・ Interface: RS-232C Baud Rate: 9600/19200 bps Placement: 20 columns and 2 lines, each column is 5 x 7 dots

- Standard Code
  CP-437, Katakana, CP-737, CP-850, CP-852,
  CP-857, CP-860, CP-862, CP-863,CP-865, CP-866,
  CP-1250, CP-1251, CP-1252, CP-1253, CP-1254,
  CP-1255, CP-1257
- International Characters
  USA, FRANCE, GERMANY, UK, DENMARK I,
  SWDEN, ITALY, SPAIN I, JAPAN, NORWAY,
  DENMARK II, SPAIN II, LATIN, KOREA,
  RUSSIA, SLAVONIC

Printer	2" or 3" easy loading thermal printer with auto-cutter Printer:

Items	Specifications
Printing method	Thermal dot line printing
Printing accuracy	1mm /5M
Paper feed pitch	0.0625 mm
Maximum Paper-Roll thickness	80mm
Total dots per line & Printable dots per line	2inch 432 dots; 3inch 576 dots
Maximum print speed	2inch 200 mm/s; 3inch 170 mm/s
Print width	2inch 54 mm; 3inch 72mm
Paper width	2inch 58 +0/-1 mm; 3inch 80 +0/-1 mm

Printer

A mm (B dots)

0.125 mm   0.125 mm

0.125 mm

2 inch (A:54, B:432)
3 inch (A:72, B:576)

C $^{0}_{-1}$ mm (Paper Width)

D mm   A mm (Printing Width)   D mm

2 inch (A:54, C:58, D:2)
3 inch (A:72, C:80, D:4)

Auto-cutter:

Items	Specifications
Paper cutting method	Slide cutting
Type of paper cutting	Full cut and Partial cut (1.5 ± 0.5 mm tab left at the center)
Paper curling tendency	Fixed blade side and Movable blade side
Minimum paper core diameter	φ8 mm (paper thickness: 75μm or thin) φ18 (paper thickness: thicker than 75μm)
Minimum paper cutting length	10 mm
Cutting processing time	Approx. 0.5 s/cycle
Cutting frequency	1 cut/2 s max.

- Standard Code
  CP-437, CP-850, CP-857, CP-737, CP-852, CP-860,CP-862, CP-863, CP-865, CP-866, CP-1250,CP-1251, CP-1252, CP-1253, CP-1254, CP-1257, Katakana

	· KANJI JAPANESE (SHIFT-JIS) Code, TRADITIONAL CHINESE Code
	· International Characters USA, FRANCE, GERMANY, UK, DENMARK I, SWDEN, ITALY, SPAIN I, JAPAN, NORWAY, DENMARK II, SPAIN II, LATIN AMERICA, KOREA, RUSSIA, SLAVONIC
Fingerprint	8-bit grayscale reader

1.4 Safety Precautions

Before using this system, read the following information carefully to protect your system from damages, and extend the life cycle of the system.

1. Check the Line Voltage
   - 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
   - Place your PA-6322 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   - Avoid installing your PA-6322 POS system in extremely hot or cold places.
   - Avoid direct sunlight exposure 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 PA-6322 when it has been left outdoors in a cold winter day.
   - Bear in mind that the operating ambient temperature is between 0°C and 35°C (32°F and 95°F).
   - Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
   - Protect your PA-6322 from strong vibrations which may cause hard disk failure.
   - Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
   - Always shut down the operation system before turning off the power.

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

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

*

2 System Configuration

This chapter contains helpful information that describes the jumper and connector settings, component locations, and pin assignment.

The following topics are included:
- System External I/O Ports Diagram
- Function Buttons and I/O Ports
- Main Board Component Locations & Jumper Settings
- Setting Jumpers
- Setting Main Board Connectors and Jumpers
- Printer Board Component Locations & Pin Assignment
- Setting Printer Board Connectors and Jumpers
  - PDAC-3100
  - MB-1030 series
  - MB-1011 & MB-1013
- Setting VFD Board Connectors and Jumpers
- Setting MSR

2.1 System External I/O Ports Diagram & Pin Assignment
Rear I/O Ports
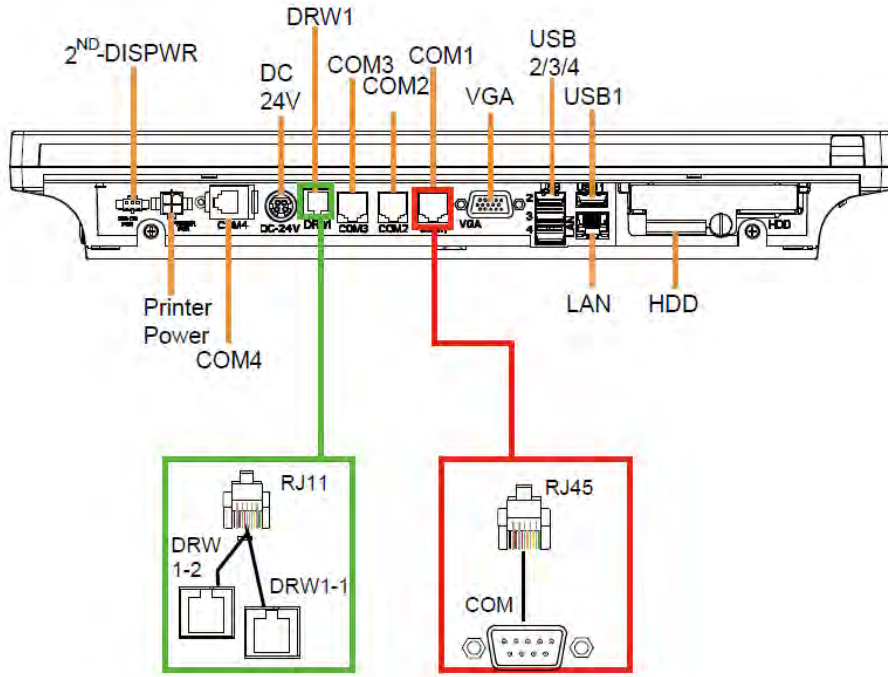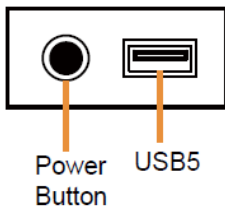
2.2 Function Buttons and I/O Ports
2.2.1 Power Button

To turn on the system, press the power button on the side of the system briefly.

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V
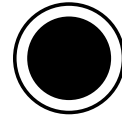
Power Button

2.2.2 DC-IN Port

DC-IN: DC Power-In Port (rear IO)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	3	+24V
2	GND	4	+24V
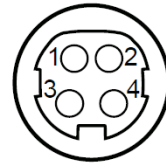
DC-IN

2.2.3 VGA Port

VGA: VGA Port, D-Sub 15-pin (rear IO)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDCA DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDCA CLK
8	GND	-	-
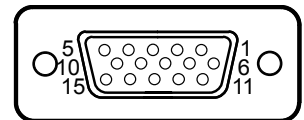
VGA

2.2.4   COM Port

COM1, COM2, COM3: COM Ports (rear IO)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD1/2/3	6	DSR1/2/3
2	RXD1/2/3	7	RTS1/2/3
3	TXD1/2/3	8	CTS1/2/3
4	DTR1/2/3	9	RI/+5V/+12V selectable (Max. current: 1A)
5	GND	-	-
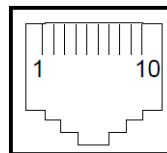
COM1/

COM2/

COM3/

COM4 (option)

Note: COM2 & COM2_1 will not function when jumpers JP10, JP11, JP12 are set as 2-3 connected (i-Button). Refer to the **i-Button Function Selection** section for details. COM4_2 will not function when COM4_1 is selected as the printer control interface.

2.2.5   USB Port

USB1, USB2, USB3, USB4, USB5: USB Type A Ports
• USB1-4: Rear IO
• USB5: Side IO

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

USB1/

USB2/

USB3/

USB4/

USB5

Note: The USB1 port is provided with Standby power 5V. The other USB ports are w/o standby power.

2.2.6 LAN Port

LAN: LAN RJ-45 Port (rear IO)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MDIP0	5	MDIP2
2	MDIN0	6	MDIN2
3	MDIP1	7	MDIP3
4	MDIN1	8	MDIN3

LAN LED Status

There are 2 LAN LED indicators for LAN on the rear panel of the system. By observing their status, you can know the status of the Ethernet connection.

RB Ver.

LAN LED Indicator	Color	Status	Description
Left Side LED	Orange	Blink	Giga LAN connection is activated.
	Green	Blink	10/100Mbps LAN connection is activated.
Right Side LED	Green	On	LAN switch/hub connected.
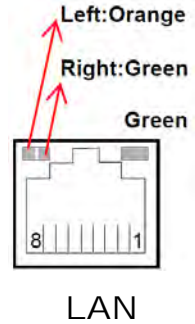
2.2.7 Printer Power Port (Optional)

PRINT PWR: DC24V power supply for the stand-printer

PIN	ASSIGNMENT
P1	GND
P2	+24V
P3	NA
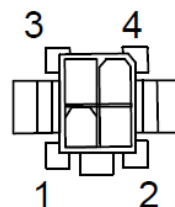
PRINT POWER

2.2.8 Cash Drawer Port

DRW1 is used by default. If you need a second port, use the method below:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DRW2 Sense	4	12V/24V (Max. current: 1A)
2	GPIO1 / DRW1	5	GPIO2 / DRW2
3	Draw1 Sense	6	GND
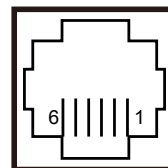
DRW1

2.2.9 2nd Display Power Port

2nd DIS PWR: DC12V power supply of for 2nd display.

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC12	3	VCC12
2	GND	-	-

2ⁿᵈ DIS PWR

2.3   Main Board Component Location & Jumper Settings
M/B: PB-6722
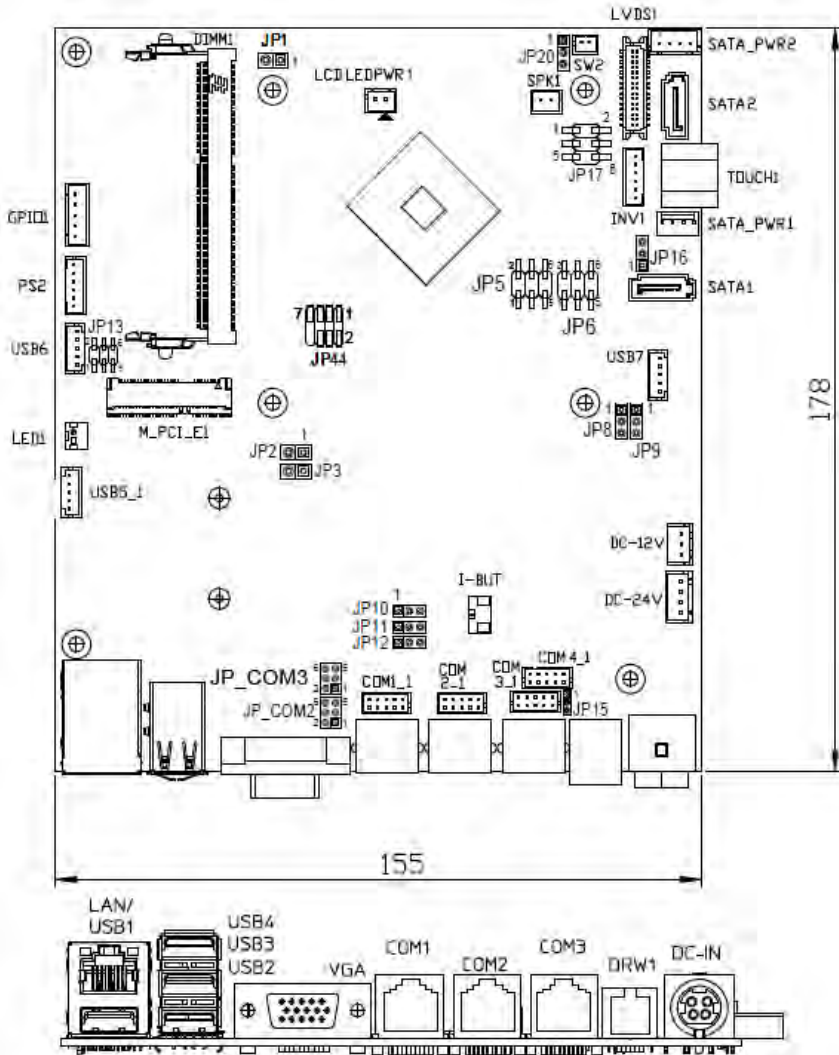
Figure 2-1. PB-6722 Main Board Component Location

⚠	**WARNING:** Always disconnect the power cord when you are working with the connectors and jumpers on the main board. Make sure both the system and the external devices are turned OFF as sudden surge of power could ruin sensitive components. Make sure PA-6322 is properly grounded.
⚡	**CAUTION:** Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while configuring the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.

2.4 Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
COM, Cash Drawer Port Voltage Selection	COM2, COM3, JP_COM2, JP_COM3 COM1, COM4, DRW1
COM Connectors	COM1_1, COM2_1, COM3_1, COM4_1
i-Button Connector	I-BUT
COM2, i-Button Function Selection	JP10, JP11, JP12
Cash Drawer Control Selection	JP15, DRW1 (DRW1-1, DRW1-2), DRW2
USB Connector	USB5_1, USB6, USB7
LED Connector	LED1
Speaker Connector	SPK1
Power Connector	DC12V, DC24V
Inverter Connector	INV1
Touch Panel Connector	TOUCH1
Reserved Connectors	SPK2, GPIO1
Panel Resolution Selection	JP5, JP6
Mini PCIE USB Selection	JP13
MSR / Card Reader Connector	PS/2_1
LVDS Connector	LVDS1
Touch Panel Signal Interface Selection	JP8, JP9
SATA & SATA Power Connector	SATA1, SATA2, SATA_PWR1, SATA_PWR2
Update BIOS Settings	JP1
Clear CMOS Data Selection	JP2
LVDS Link	JP16
LVDS Voltage Selection	JP17
Panel Enable	JP20
Mini-PCIe / mSATA Connector	SLOT1

2.5 Setting 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. 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 configure your hardware settings by "opening" or "closing" jumpers.

Jumpers can be combined into sets that are 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 & Caps

2 Pin Jumper   3 Pin Jumper   Jumper Block   Jumper Cap
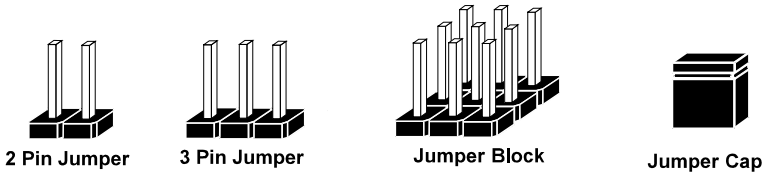
If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different types of jumpers and jumper settings.

Jumper Diagrams

Jumper Cap looks like this
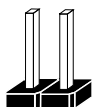
2 pin Jumper looks like this
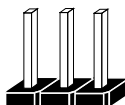
3 pin Jumper looks like this
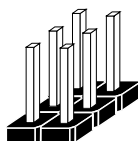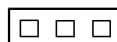
Jumper Block looks like this
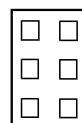
Jumper Settings

2 pin Jumper closed(enabled)
looks like this

1

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

1

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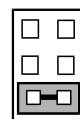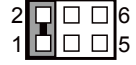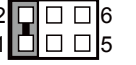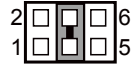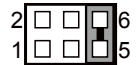
1 2

2.6   Setting Main Board Connectors and Jumpers
2.6.1   COM, Cash Drawer Port Voltage Selection

COM2 / COM3: The voltages of both COM2 & COM3 ports can be adjusted by setting relevant jumpers on board.

JP_COM2, JP_COM3: Pin headers on board

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
RI (Default)	1-2	JP_COM2	JP_COM3
+12V	3-4	JP_COM2	JP_COM3
+5V	5-6	JP_COM2	JP_COM3

COM1 / COM4 /DRW1
The voltages of the external ports "COM1 & COM4 & Cash Drawer" can be adjusted via BIOS for your convenience.

2.6.2   COM Connectors

COM1_1, COM2_1, COM3_1, COM4_1: COM Connectors

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

COM1_1/

COM2_1/

COM3_1/

COM4_1

2.6.3   i-Button Connector

I-BUT: i-Button Connector

PIN	ASSIGNMENT
1	COM3_DTR_R_I
2	COM3_RXD_R_I
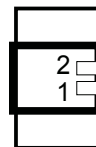
I-BUT

2.6.4   COM2 & i-Button Function Selection

JP10, JP11, JP12: i-Button Function Connectors

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM2 (Default)	1-2	**JP10/JP11/JP12/**
I-BUT*	2-3	**JP10/JP11/JP12/**

*COM2 & COM2_1 will not function when jumpers JP10, JP11 & JP12 are set as "I-BUT".

2.6.5   Cash Drawer Control Selection

JP15: DRW1, DRW1-1, DRW1-2
DRW1 port is used by default. You can add a
second port via either of the methods below:

Method 1:
DRW1 includes two groups of GPIO pins.
The second group is normally unused but can be
enabled by the jumper. Set the pin header jumper
JP15 as 1-2 connected if necessary.
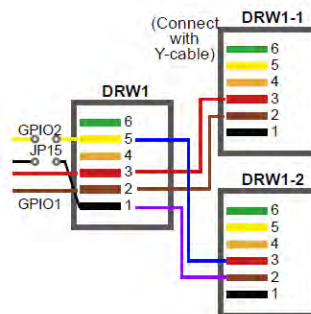
Method 2:
You can split DRW1 into two channels of
DRW1-1 & DRW1-2 using the Y-Cable (option).

JP15: Cash Drawer 2 Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
DRW1-1 & DRW1-2	1-2	
DRW1-1 only	2-3	
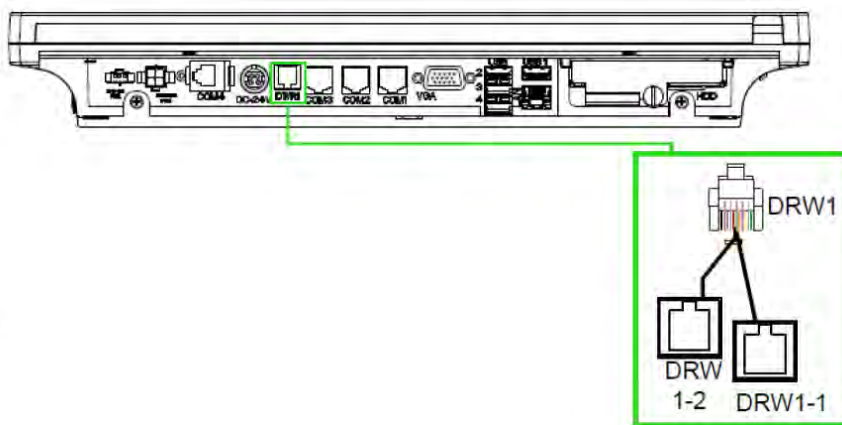
Step 3.
DRW1, DRW1-1, DRW1-2 shares the same power source.
(Default: 12V).

SIO Address	
Cash drawer 1	LDN 06, 0x91 bit 2
Cash drawer 2	LDN 06, 0x91 bit 3

Cash Drawer Configuration

The I/O port address of the cash drawer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Configuration Sequence
To program F81866 configuration registers, the following configuration sequence must be followed:
(1) Enter the extended function mode
(2) Configure the configuration registers
(3) Exit the extended function mode

(1) Enter the extended function mode
To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

(2) Configure the configuration registers
The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x06) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

(3) Exit the extended function mode
To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Code example for open the cash drawer 1

```
;------ Enter to extended function mode ------------------------------------------------------
mov dx, 2eh
mov al, 87h
out dx, al
out dx, al
;------ Select Logical Device 6 of Cash drawer --------------------------------------------
mov al, 07h
out dx, al
inc dx
mov al, 06h
out dx, al
dec dx
;------ Open the Cash drawer 1 ------------------------------------------
mov al, 91h
out dx, al
inc dx
mov al, 04h
out dx, al
;------ Exit the extended function mode --------------------------------------------------------
dec dx
mov al, 0aah
out dx, al
```

Note:

The DRW2 Port can function only when the optional "Printer Kit" is installed on PA-6322. The DRW2 signals from the printer board (MB-1030, MB-1011, MB-1013, PDAC-3100) can be controlled via relevant commands. The DRW2 port is located at the bottom of the Printer Stand connected with a cable (optional) as shown below:
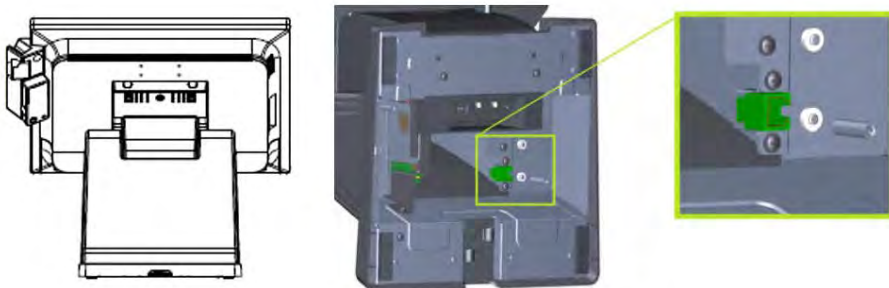
Printer Stand Bottom View

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	4	+24V
2	Drawer Open	5	NC
3	Drawer Sense	6	GND
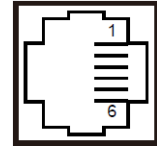
DRW2

Control Codes	Hexadecimal Codes	Function
<DLE EOT>	10 04	Real-time status transmission
<DLE DC4>	10 14	Real-time output of the specified pulse

2.6.6　USB Connector

USB5_1, USB6, USB7: USB 2.0 connector

PIN	ASSIGNMENT
1	5V (Maximum current: 0.5A)
2	D-
3	D+
4	GND
5	GND
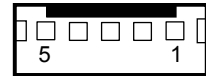
USB5_1/ USB6/ USB7

Notes:
1. USB6 signal is shared from the "MINI-PCIE" port.
2. USB6 can function only when JP13 is set as 1-3, 2-4[short].
3. USB7 signal is shared from the "Touch Controller".
4. USB7 can function only when JP8, JP9 are set as 1-2[short].

2.6.7　LED Connector
LED1: Power indication LED connector

PIN	ASSIGNMENT
1	GND
2	PWR_LED
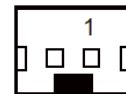
LED1

2.6.8   Speaker Connector

SPK1: Speaker Connector

PIN	ASSIGNMENT
1	HD_FRONT-OUT-R
2	HD_FRONT-OUT-L
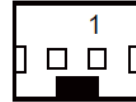
SPK1

2.6.9   Power Connector

DC12V: DC 12 Voltage Provider Connector

PIN	ASSIGNMENT
1	VCC12
2	GND
3	VCC12
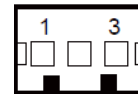
DC12V

DC24V: Power for Thermal Printer Connector

PIN	ASSIGNMENT
1	VCC24
2	VCC24
3	GND
4	GND
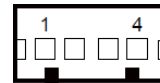
DC24V

2.6.10   Inverter Connector

INV1: Inverter connector

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

INV1

2.6.11   Touch Panel Connector

TOUCH1: Touch panel connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LR (Low Right)	4	UR (Up Right)
2	LL (Low Left)	5	UL (Up Left)
3	Probe	-	-
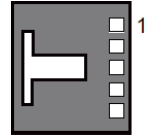
TOUCH1

2.6.12   Reserved Connectors

SPK2: External audio phone jack reserved connector

PIN	ASSIGNMENT
1	HD_FRONT-OUT-L
2	GND
3	HD_FRONT-OUT-R
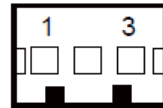
SPK2

GPIO1: 2 ports GPIO & DC5V & DC3.3V reserved connector
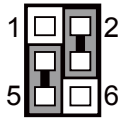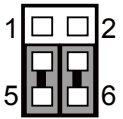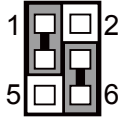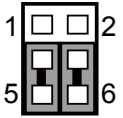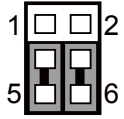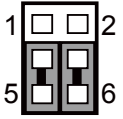
PIN	ASSIGNMENT
1	GPIO1
2	GPIO2
3	5V (Maximum current: 0.5A)
4	3.3V ((Maximum current: 0.5A)
5	GND

GPIO1
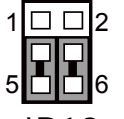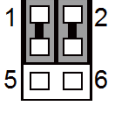
2.6.13   Panel Resolution Selection

JP5, JP6: Panel resolution control connectors

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
1024 x 768 (24 bit)	JP5: 3-5, 2-4 JP6: 3-5, 4-6	**JP5**	**JP6**
1024 x 768 (18 bit) (Default)	JP5: 1-3, 4-6 JP6:3-5, 4-6	**JP5**	**JP6**
800 x 600 (18 bit)	JP5: 3-5, 4-6 JP6: 3-5, 4-6	**JP5**	**JP6**

2.6.14   Mini PCIE USB Selection

JP13: "USB6 signal support to" selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
USB signal to mini-PCIE	3-5, 4-6	**JP13**
USB signal to USB6 wafer	1-3, 2-4	**JP13**

2.6.15 MSR / Card Reader Connector

PS/2_1: MSR / Card reader connector

PIN	ASSIGNMENT
1	KB_CLK (Output)
2	KB_CLK_C (Input)
3	KB_DATA_C (Input)
4	KB_DATA (Output)
5	+5V
6	GND
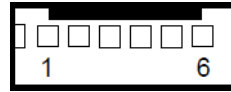
PS/2_1

2.6.16 LVDS Connector

LVDS1: LVDS Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LVDS_VCC	16	LVDS_CLKA_D+
2	PANEL_Reverse	17	VDS_CLKA_D-
3	LVDS_CLKB_D-	18	GND
4	LVDS_CLKB_D+	19	LVDS_A2_D+
5	GND	20	LVDS_A2_D-
6	LVDS_B2_D-	21	GND
7	LVDS_B2_D+	22	LVDS_A1_D+
8	GND	23	LVDS_A1_D-
9	LVDS_B1_D-	24	GND
10	LVDS_B1_D+	25	LVDS_A0_D+
11	LVDS_B3_D+	26	LVDS_A0_D-
12	LVDS_B3_D-	27	LVDS_A3_D+
13	LVDS_B0_D+	28	LVDS_A3_D-
14	LVDS_B0_D-	29	LVDS_VCC
15	GND	30	LVDS_VCC
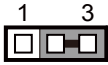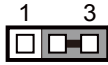
LVDS1

2.6.17 Touch Panel Signal Interface Selection

JP8, JP9: Control connectors for touch panel signal interface

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
USB7 Connector	JP8: 1-2 JP9: 1-2	1 3 **JP8**	1 3 **JP9**
USB Interface	JP8: 2-3 JP9: 2-3	1 3 **JP8**	1 3 **JP9**

2.6.18 SATA & SATA Power Connector

SATA1, SATA2: Serial ATA connectors

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	G1	5	RX-
2	TX+	6	RX+
3	TX-	7	G3
4	G2	-	-

SATA1/ SATA2
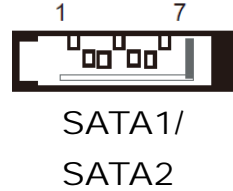
SATA_PWR1, SATA_PWR2: Serial ATA power connectors

PIN	ASSIGNMENT
1	VCC
2	GND
3	GND
4	VCC12

SATA_PWR1/ SATA_PWR2
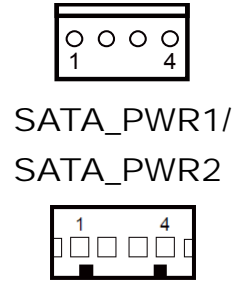
2.6.19   Update BIOS Settings

JP1: Update BIOS settings

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal (Default)	Open	1 □□ **JP1**
Update BIOS*	1-2	1 ■■ **JP1**

2.6.20   Clear CMOS Data Selection
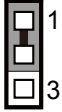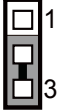
JP2: Clear CMOS data selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal (Default)	Open	1 □□ **JP2**
Clear CMOS*	1-2	1 ■■ **JP2**

*To clear CMOS data, power off the computer first and set the jumper to "Clear CMOS" as shown above. After five to six seconds, set the jumper back to "Normal" and power on the computer.
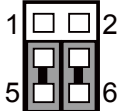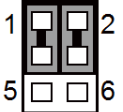
2.6.21   LVDS Link (JP16)

JP16: LVDS Link

Selection	Jumper Setting	Jumper Illustration
5V	1-2	1 3 **JP16**
0V	2-3	1 3 **JP16**
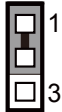
2.6.22   LVDS Voltage Selection (JP17)

JP17: LVDS Voltage Selection

Selection	Jumper Setting	Jumper Illustration
3.3V	3-5, 4-6	1 2 5 6 **JP17**
5V	1-3, 2-4	1 2 5 6 **JP17**

2.6.23   Panel Enable (JP20)

JP20: Panel Enable

Selection	Jumper Setting	Jumper Illustration
Power Supply 5V	1-2	1 ▢ 3 **JP20**

2.6.24   Mini-PCIe / mSATA Connector

SLOT1: Mini-PCIe connector, USB function not supported

SLOT1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE#	27	GND
2	+3.3V	28	+1.5V
3	Reserved	29	GND
4	GND	30	SMB_CLK
5	Reserved	31	PETn2
6	+1.5V	32	SMB_DATA
7	CLKREQ#	33	PETp2
8	Reserved	34	GND
9	GND	35	GND
10	Reserved	36	USB D-
11	REFCLK1-	37	GND
12	Reserved	38	USB D+
13	REFCLK1+	39	+3.3V
14	Reserved	40	GND
15	GND	41	+3.3V
16	Reserved	42	Reserved
17	Reserved	43	GND
18	GND	44	Reserved
19	Reserved	45	NC
20	Reserved	46	Reserved
21	GND	47	NC
22	PERST#	48	+1.5V
23	PERn0	49	NC
24	+3.3SB	50	GND
25	PERp0	51	Reserved
26	GND	52	+3.3V
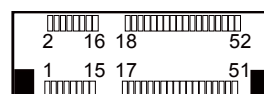
2.7 Printer Board Component Locations & Pin Assignment

2.7.1 Printer Board: PDAC-3100
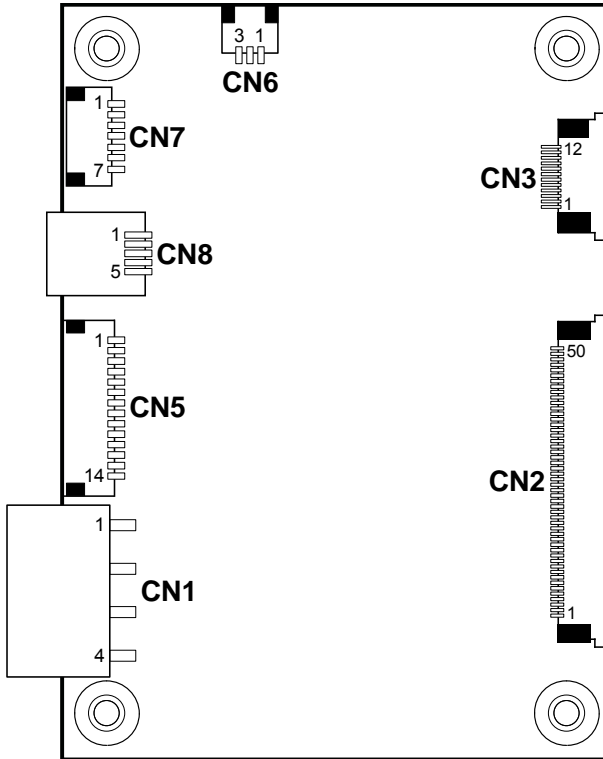
Figure 2-2. PDAC-3100 Printer Board Component Locations

2.7.2   Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
Power Supply Connector	CN1
RS-232 Interface Connector	CN7
Auto-Cutter Connector	CN3
USB Connector	CN8
Thermal Head/Motor/Sensor Connector	CN2
Terminal Assignment Connector	CN5

2.7.3 Setting Printer Board Connectors and Jumpers: PDAC-3100

2.7.3.1 Power Supply Connector

CN1: Power supply wafer

PIN	ASSIGNMENT
1	+24V
2	+24V
3	GND
4	GND
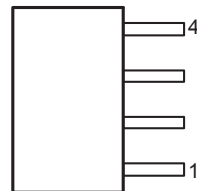
CN1

2.7.3.2 RS-232 Interface Connector

CN7: RS-232 interface connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TXD	5	DTR
2	RXD	6	DSR
3	RTS	7	GND
4	CTS	-	-
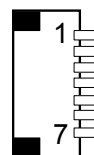
CN7

2.7.3.3 Auto-Cutter Connector

CN3: Auto-cutter wafer

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

CN3

2.7.3.4 USB Connector

CN8: USB Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Vbus	4	NC
2	D-	5	GND
3	D+	-	-
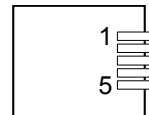
CN8

2.7.3.5 Thermal Head/Motor/Sensor Connector

CN2: Thermal head/motor/sensor connector

PIN	ASSIGNMENT	FUNCTION
1	24V	Head drive power
2	24V	Head drive power
3	24V	Head drive power
4	24V	Head drive power
5	24V	Head drive power
6	24V	Head drive power
7	DAT	Print data output
8	CLK	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
14	GND	Head GND
15	NC	Unused
16	DST4	Head strobe signal
17	DST3	Head strobe signal
18	3.3V	Logic Power
19	GND	Thermistor GND
20	GND	Thermistor GND
21	TH	Thermistor signal
22	NC	Unused
23	DST2	Head strobe signal
24	DST1	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	Print data latch
32	24V	Head drive power
33	24V	Head drive power
34	24V	Head drive power
35	24V	Head drive power

CN2

PIN	ASSIGNMENT	FUNCTION
36	24V	Head drive power
37	24V	Head drive power
38	NC	Unused
39	PS	Signal of the out-of-paper sensor
40	Vps	Power supply of the out-of-paper sensor
41	GND	GND of the platen position/ out-of-paper sensor
42	HS	Signal of the platen position sensor
43	NC	Unused
44	FG	Frame GND
45	FG	Frame GND
46	NC	Unused
47	2A	Motor drive signal
48	1B	Motor drive signal
49	1A	Motor drive signal
50	2B	Motor drive signal

2.7.3.6 Terminal Assignment Connector

CN5: Terminal assignment connector

PIN	ASSIGNMENT	FUNCTION
1	FEED	Feed signal
2	RESET	Reset signal
3	GND	GND
4	ST1	Status signal
5	ST2	Status signal
6	ST3	Status signal
7	ST4	Status signal
8	GND	GND
9	DRS	Drawer sensor signal
10	DSW	Drawer switch signal
11	Vdu	Drive terminal for the drawer (Vp side)
12	GNDdu	Drive terminal for the drawer (GND side)
13	GND	GND
14	NC	Unused

CN5

2.7.4   Printer Board: MB-1030 series
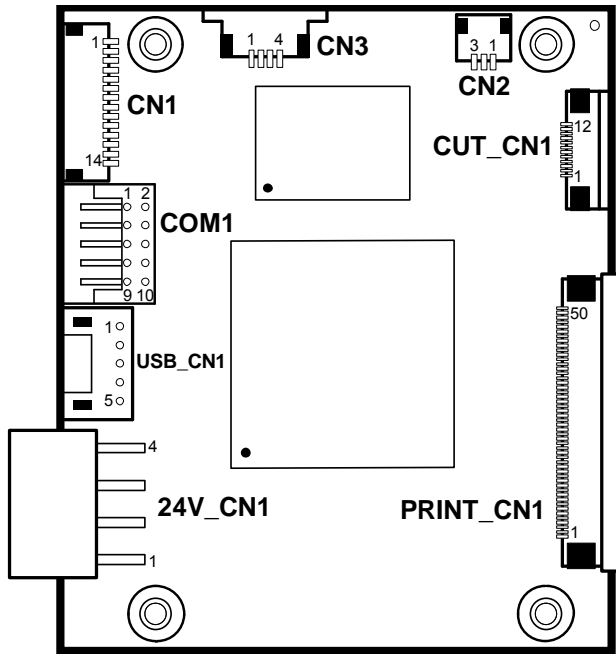
Figure 2-3. MB-1030 Printer Board Component Locations

2.7.4.1 Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
Power Supply Connector	24V_CN1
RS-232 Interface Connector	COM1
Thermal Head/Motor/Sensor Connector	PRINT_CN1
Auto-Cutter Connector	CUT_CN1
Paper-Near-END Sensor Connector	CN2
USB Interface Connector	USB_CN1
Terminal Assignment Connector	CN1

2.7.5 Setting Printer Board Connectors and Jumpers

2.7.5.1 Power Supply Connector

24V_CN1: Power Supply Wafer

PIN	ASSIGNMENT
1	GND
2	GND
3	+24V
4	+24V
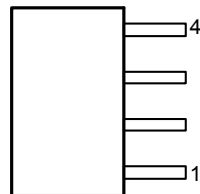
2.7.5.2 RS-232 Interface Connector

COM1: RS-232 Interface Connector

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
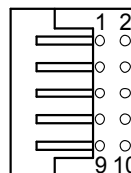
2.7.5.3 Thermal Head/Motor/Sensor Connector

PRINT_CN1: Thermal head/motor/sensor connector

PIN	ASSIGNMENT	FUNCTION
1	24V	Head drive power
2	24V	Head drive power
3	24V	Head drive power
4	24V	Head drive power
5	24V	Head drive power
6	24V	Head drive power
7	DAT	Print data output
8	CLK	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
14	GND	Head GND
15	NC	Unused
16	DST4	Head strobe signal
17	DST3	Head strobe signal
18	3.3V	Logic Power
19	GND	Thermistor GND
20	GND	Thermistor GND
21	TH	Thermistor signal
22	NC	Unused
23	DST2	Head strobe signal
24	DST1	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	Print data latch
32	24V	Head drive power
33	24V	Head drive power
34	24V	Head drive power
35	24V	Head drive power

50

1

PRINT_CN1

PIN	ASSIGNMENT	FUNCTION
36	24V	Head drive power
37	24V	Head drive power
38	NC	Unused
39	PS	Signal of the out-of-paper sensor
40	Vps	Power supply of the out-of-paper sensor
41	GND	GND of the platen position/ out-of-paper sensor
42	HS	Signal of the platen position sensor
43	NC	Unused
44	FG	Frame GND
45	FG	Frame GND
46	NC	Unused
47	2A	Motor drive signal
48	1B	Motor drive signal
49	1A	Motor drive signal
50	2B	Motor drive signal

2.7.5.4 Auto-Cutter Connector

CUT_CN1: Auto-cutter Connector

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

CUT_CN1

2.7.5.5 Paper-Near-END Sensor Connector

CN2: Paper-near-end sensor connector

PIN	ASSIGNMENT	FUNCTION
1	Vns	Power supply of the near end sensor
2	NS	Signal of the near end sensor
3	GND	GND of the near end sensor

CN2

2.7.5.6 USB Interface Connector

USB_CN1: USB interface connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Vbus	4	GND
2	D-	5	GND
3	D+	-	-
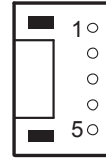
USB_CN1

2.7.5.7 Terminal Assignment Connector

CN1: Terminal assignment connector

PIN	ASSIGNMENT	FUNCTION
1	FEED	Feed signal
2	RESET	Reset signal
3	GND	GND
4	ST1	Status signal
5	ST2	Status signal
6	ST3	Status signal
7	ST4	Status signal
8	GND	GND
9	DRS	Drawer sensor signal
10	DSW	Drawer switch signal
11	Vdu	Drive terminal for the drawer (Vp side)
12	GNDdu	Drive terminal for the drawer (GND side)
13	GND	GND
14	NC	Unused

CN1

2.7.6   Printer Board: MB-1011 & MB-1013
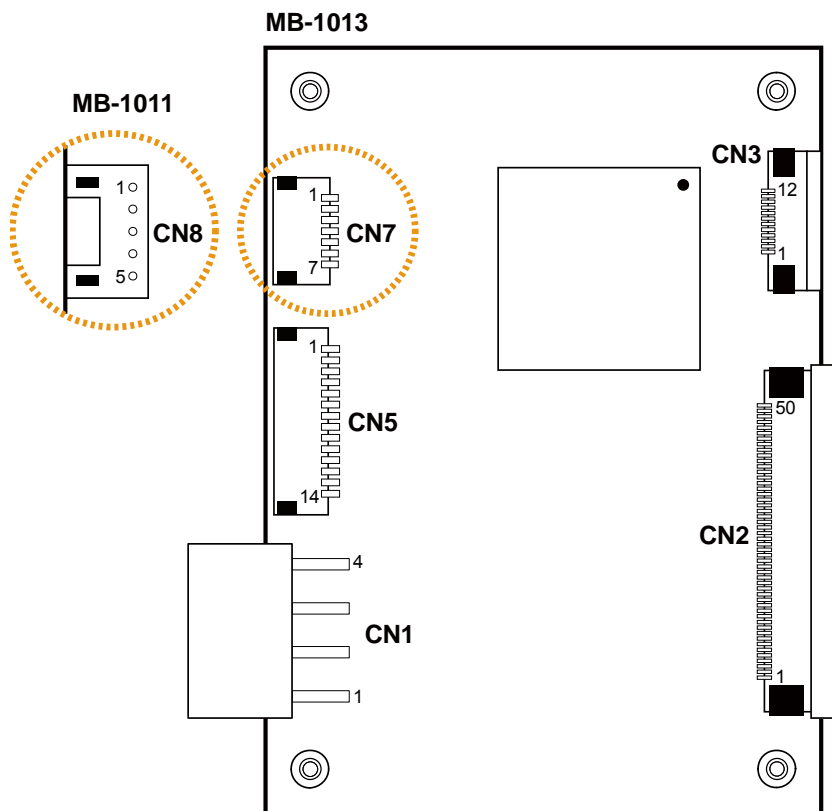
Figure 2-4. MB-1011 & MB-1013 Printer Board Component Locations

2.7.6.1   Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
Power Supply Connector	CN1
RS-232 Interface Connector	CN7
Auto-Cutter Connector	CN3
Thermal Head/Motor/Sensor Connector	CN2
Terminal Assignment Connector	CN5
USB Interface Connector	CN8

2.7.7 Setting Printer Board Connectors and Jumpers: MB-1011 & MB-1013

2.7.7.1 Power Supply Connector

CN1: Power supply wafer

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

CN1
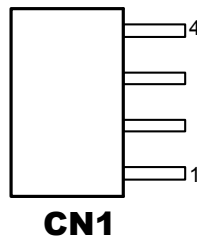
2.7.7.2 RS-232 Interface Connector

CN7: RS-232 interface connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TXD	5	DTR
2	RXD	6	DSR
3	RTS	7	GND
4	CTS	-	-

CN7
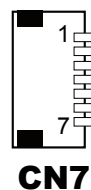
2.7.7.3 Auto-Cutter Connector

CN3: Auto-cutter Connector

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

CN3

2.7.7.4 Thermal Head/Motor/Sensor Connector

CN2: Thermal head/motor/sensor connector

PIN	ASSIGNMENT	FUNCTION
1	24V	Head drive power
2	24V	Head drive power
3	24V	Head drive power
4	24V	Head drive power
5	24V	Head drive power
6	24V	Head drive power
7	DAT	Print data output
8	CLK	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

CN2

PIN	ASSIGNMENT	FUNCTION
14	GND	Head GND
15	NC	Unused
16	DST4	Head strobe signal
17	DST3	Head strobe signal
18	3.3V	Logic Power
19	GND	Thermistor GND
20	GND	Thermistor GND
21	TH	Thermistor signal
22	NC	Unused
23	DST2	Head strobe signal
24	DST1	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	Print data latch
32	24V	Head drive power
33	24V	Head drive power
34	24V	Head drive power
35	24V	Head drive power
36	24V	Head drive power
37	24V	Head drive power
38	NC	Unused
39	PS	Signal of the out-of-paper sensor
40	Vps	Power supply of the out-of-paper sensor
41	GND	GND of the platen position/ out-of-paper sensor
42	HS	Signal of the platen position sensor
43	NC	Unused
44	FG	Frame GND
45	FG	Frame GND
46	NC	Unused
47	2A	Motor drive signal
48	1B	Motor drive signal
49	1A	Motor drive signal

PIN	ASSIGNMENT	FUNCTION
50	2B	Motor drive signal

2.7.7.5   Terminal Assignment Connector

CN5: Terminal assignment connector

PIN	ASSIGNMENT	FUNCTION
1	FEED	Feed signal
2	RESET	Reset signal
3	GND	GND
4	ST1	Status signal
5	ST2	Status signal
6	ST3	Status signal
7	ST4	Status signal
8	GND	GND
9	DRS	Drawer sensor signal
10	DSW	Drawer switch signal
11	Vdu	Drive terminal for the drawer (Vp side)
12	GNDdu	Drive terminal for the drawer (GND side)
13	GND	GND
14	NC	Unused

2.7.7.6   USB Interface Connector

CN8: USB interface connector

PIN	ASSIGNMENT
1	Vbus
2	D-
3	D+
4	GND
5	GND
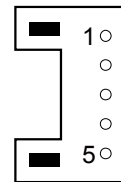
2.8   VFD Board Component Locations & Pin Assignment

2.8.1   VFD Board: MB-4103, LD720
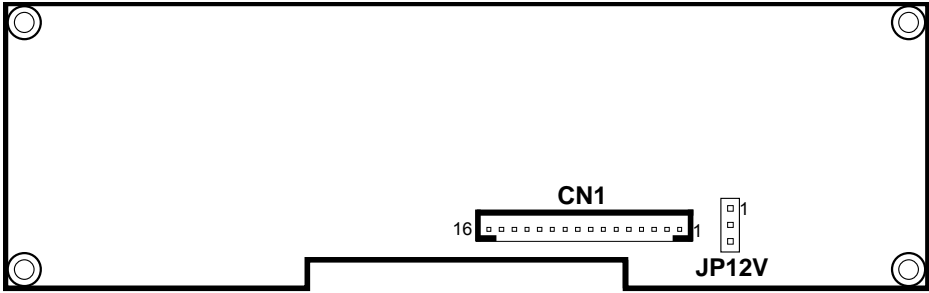
Figure 2-5. MB-4103 & LD720 VFD Board Component Locations
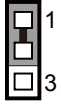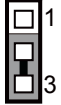
2.8.2   Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
Power Switch Selection	JP12V
RS-232 Serial Interface Connector	CN1

2.8.3 Setting MB-4103 & LD720 VFD Board Connectors and Jumpers

2.8.3.1 Power Switch Selection

JP12V: Power Switch Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
OFF	1-2	 1 3 **JP12V**
ON (Default)	2-3	 1 3 **JP12V**

2.8.3.2 RS-232 Serial Interface Connector

CN1: RS-232 serial interface wafer

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	9	NC
2	TXD	10	NC
3	RXD	11	NC
4	DTR	12	NC
5	DSR	13	NC
6	RTS	14	NC
7	CTS	15	NC
8	+12V/+5V	16	NC

16   1

CN1
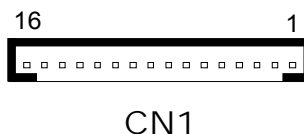
2.9   MSR Board Component Locations & Pin Assignment

2.9.1   ID TECH

ID-TECH MSR Board Component Locations

2.9.1.1   Main Connector

CN:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Chassis Ground	5	K-CLK (Computer connections)
2	P-CLK (Keyboard connections)	6	K-DATA (Computer connections)
3	P-DATA (Keyboard connections)	7	GND
4	+5V Vcc	-	-
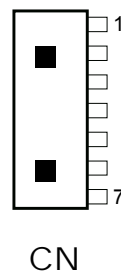
2.9.2   MB-3012

Figure 2-6. MB-3012 MSR Board Component Locations

2.9.2.1   Information Button Reader

I_BUTTON1: Information button reader

PIN	ASSIGNMENT
1	I_B1
2	GND
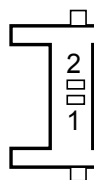
I_BUTTON1

2.9.2.2   Output Connector

IO1: Output wafer

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
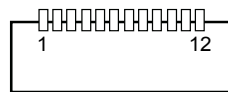
IO1

3 Software Utilities

This chapter provides the detailed information of driver utilities and BIOS settings for the system. The following topics are included:

- Driver
  - Intel® Chipset Software Installation Utility
  - VGA Driver Utility
  - LAN Driver Utility
  - Sound Driver Utility
  - Touchscreen Driver Utility
  - Fingerprint Driver Utility (Optional)
  - RFID Module Driver (Optional)
  - Wireless Module Driver (Optional)
- Embedded Peripheral Devices
  - Printer Board: MB-1030
  - VFD: MB-4103 (RS-232)
  - MSR: MB-3102 (PS/2)
  - MSR: GIGA-TMS MJR243 (RS-232)
- API
- BIOS Operation
  - BIOS Setup
  - Watchdog Timer Configuration
  - Update Procedure
  - System Resource Map

3.1   DRIVER

3.1.1   Introduction

Enclosed with the PA-6322 Series package is our driver utilities, which comes in a CD-ROM format.

3.1.1.1   API Package Folder

Refer to the **3.3 API** section for the details.

+--->\DEMO PROJECT\

+--->\ProxAPI standard\

+--->\Document\

3.1.1.2   Driver Folder

1. The setup sequence is "Main Chip -> VGA -> LAN -> SOUND ->
    TOUCH[Device folder]"

2. You will be prompted to reboot the system when the installation is completed.

+--->\Flash BIOS\AFUa.bat

+--->\Platform\

+--->\Device\

3.1.1.3   User Manual Folder

\AdbeRdr930_en_US.exe (PDF File reader)

3.1.1.4 README
The DRIVER DISC introduction

3.1.2 Intel® Chipset Software Installation Utility

3.1.2.1 Introduction

The Intel® Chipset Software Installation Utility installs Windows ***.INF** files to the target system. These files outline to the operating system how to configure the Intel chipset components in order to ensure the following features function properly:

• SATA Storage Support (SATA & SATA II)
• USB Support
• Identification of Intel® Chipset Components in Device Manager

3.1.2.2 Installing Intel® Chipset Driver

The utility pack is to be installed only for POSReady 7 & Embedded 8 Industry series, and it should be installed right after the OS installation is completed. Please follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "Main Chip" folder where the Chipset driver is located (depending on your OS platform).
3. Click *Setup.exe* file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.3 VGA Driver Utility

The VGA interface embedded with PA-6322 can support a wide range of display types. You can have dual displays by configuring CRT & LVDS interfaces to work simultaneously.

3.1.3.1 Installing VGA Driver

To install the VGA driver, follow the steps below:

1. Connect the USB-CD ROM device to PA-6322 and insert the driver disk.
2. Open the "VGA" folder where the VGA driver is located (depending on your OS platform).

3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.4   LAN Driver Utility

PA-6322 is enhanced with LAN function that can support various network adapters. Installation platform for the LAN driver is listed as follows:

3.1.4.1   Installing LAN Driver
To install the LAN Driver, follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "LAN" folder where the LAN driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

For more details on the installation procedure, please refer to the Readme.txt file found on LAN Driver Utility.

3.1.5 Sound Driver Utility

The sound function enhanced in this system is fully compatible with Windows POSReady 7 & Embedded 8 Industry series. Below, you will find the content of the Sound driver.

3.1.5.1 Installing Sound Driver

To install the Sound Driver, follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "Sound" folder where the sound driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.6 Touchscreen Driver Utility

The touchscreen driver utility can only be installed on Windows POSReady 7 & Embedded 8 Industry series, and it should be installed right after the OS installation is completed.

3.1.6.1 Installing Touchscreen Driver

To install the touchscreen driver, follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "Device\Touch Screen" folder where the touchscreen driver is located.
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.7 Fingerprint Driver Utility (Optional)

The fingerprint driver utility can only be installed on a Windows platform, and it should be installed right after the OS installation is completed.

3.1.7.1 Installing Fingerprint Driver

To install the fingerprint driver, follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "Device\Embedded Finger Printer" folder where the fingerprint driver is located.
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.8 RFID Module Driver Utility (Optional)

The RFID driver utility can only be installed on Windows POSReady7 & Embedded 8 industry series, and it should be installed right after the OS installation is completed.

3.1.8.1 Installing RFID Module Driver

To install the RFID Module driver, follow the steps below:

1. Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2. Open the "Device\RFID Module" folder where the RFID Module driver is located.
3. Click **Autorun.exe** file for driver installation.
4. Select **Mifare Demo Software V1.5R8**.
5. Follow the on-screen instructions to complete the installation.
6. Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.1.9   Wireless Module Driver Utility (Optional)

The wireless driver utility can only be installed on Windows POSReady7 & Embedded 8 Industry series, and it should be installed right after the OS installation is completed.

3.1.9.1   Installing Wireless Driver

To install the wireless driver, follow the steps below:

1.   Connect the USB CD-ROM device to PA-6322 and insert the driver disk.
2.   Open the "Device\Embedded Wireless Module" folder where the wireless driver is located.
3.   Click **Setup.exe** file for driver installation.
4.   Follow the on-screen instructions to complete the installation.
5.   Once the installation is completed, shut down the system and restart PA-6322 for the changes to take effect.

3.2 EMBEDDED PERIPHERAL DEVICES

The Command lists and driver installation guide for peripheral devices of the system - printer board, VFD and MSR – are explicitly included in the sections below:

3.2.1 Printer Board: MB-1030
3.2.1.1 Commands

1. Printer Registry Operation

Registry Name	Default Data	Notes
BaudRate	115200	-
BitLength	8	-
Parity	N	-
Stop	1	-

2. Commands List

Standard Commands

Command	RA	RB	Command	RA	RB	Command	RA	RB
HT		V	ESC D		V	GS /	V	V
LF	V	V	ESC E	V	V	GS :		
FF		V	ESC G		V	GS B	V	V
CR	V	V	ESC J	V	V	GS H	V	V
CAN		V	ESC L		V	GS I	V	V
DLE EOT	V	V	ESC M	V	V	GS L	V	V
DLE ENQ		V	ESC c 4		V	GS P	V	V
DLE DC4	V	V	ESC c 5		V	GS V	V	V
ESC FF		V	ESC d	V	V	GS W		V
ESC SP	V	V	ESC p	V	V	GS \		
ESC !	V	V	ESC t	V	V	GS ^		
ESC $	V	V	ESC {	V	V	GS a	V	V
ESC %			FS g 1			GS b		
ESC &			FS g 2			GS f	V	V
ESC *		V	FS p	V	V	GS h	V	V
ESC	V	V	FS q	V	V	GS k	V	V
ESC 2	V	V	GS !	V	V	GS r	V	V
ESC 3	V	V	GS $		V	GS v 0	V	V
ESC =	V	V	GS *	V	V	GS w	V	V
ESC ?			GS (A	V	V			
ESC @	V	V	GS (K		V			

Kanji Control Commands

Command	MB-1030 RA	MB-1030 RB
FS !	V	V
FS &	V	V
FS		V
FS .	V	V
FS 2		
FS C		
FS S		V
FS W		V

Other Commands

Command	MB-1030 RA	MB-1030 RB
ESC i	V	V
ESC m	V	V
DC2 ;		V
GS p 1		V

COMMANDS LIST

Standard Commands

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<HT>	09	Horizontal tab	V	V
<LF>	0A	Print and line feed	V	V
<FF>	0C	Print and recover to standard mode (in page mode)	Ignored	V
<CR>	0D	Print and carriage return	V	V
<CAN>	18	Cancel print data in page mode	Ignored	V
<DLE EOT>	10 04	Real-time status transmission	V	V
<DLE ENQ>	10 05	Real-time request to printer	V	V
<DLE DC4>	10 14	Real-time output of specified pulse	V	V
<ESC FF>	1B 0C	Print data in page mode	Ignored	V
<ESC SP>	1B 20	Set right-side character spacing	V	V
<ESC !>	1B 21	Select print mode(s)	V	V
<ESC $>	1B 24	Set absolute print position.	V	V
<ESC *>	1B 2A	Select bit image mode	V	V
<ESC ->	1B 2D	Turn underline mode on/off.	V	V
<ESC 2>	1B 32	Select default line spacing	V	V
<ESC 3>	1B 33	Set line spacing	V	V
<ESC =>	1B 3D	Select peripheral device	V	V
<ESC @>	1B 40	Initialize printer	V	V
<ESC D>	1B 44	Set horizontal tab position	V	V
<ESC E>	1B 45	Turn emphasized mode on/off	V	V
<ESC G>	1B 47	Turn double-strike mode on/off	V	V

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<ESC J>	1B 4A	Print and feed paper	V	V
<ESC L>	1B 4C	Select page mode	◎	Ignored
<ESC M >	1B 4D	Select character font	V	V
<ESC R>	1B 52	Select an international character set	V	V
<ESC S>	1B 53	Select standard mode	Ignored	V
<ESC T>	1B 54	Select print direction in page mode	▲	V
<ESC V>	1B 56	Turn 90 degree clockwise rotation mode on/off	V	▲
<ESC W>	1B 57	Set printing area in page mode	▲	V
<ESC \>	1B 5C	Set relative print position	V	V
<ESC a>	1B 61	Select justification	◎	▲
<ESC c 3>	1B 63 33	Select paper sensor(s) to output paper-end signals	V	V
<ESC c 4>	1B 63 34	Select paper sensor(s) to stop printing	V	V
<ESC c 5>	1B 63 35	Enable/disable panel buttons	V	V
<ESC d>	1B 64	Print and feed n lines	V	V
<ESC i>	1B 69	Full cut	V	Disabled
<ESC m>	1B 6D	Partial cut	V	Disabled
<ESC p>	1B 70	General pulse	V	V
<ESC t>	1B 74	Select character code table	V	V
<ESC {>	1B 7B	Turn upside-down printing mode on/off	◎	▲
<FS p>	1C 70	Print NV bit image	V	Disabled
<FS q>	1C 71	Define NV bit image	◎	Disabled
<GS !>	1D 21	Select character size		V
<GS $>	1D 24	Set absolute vertical print position in page mode	Ignored	V
<GS *>	1D 2A	Define download bit images	V	V
<GS (A>	1D 28 41	Execute test print	V	Disabled
<GS (K>	1D 28 4B	Set print density	V	Disabled
<GS />	1D 2F	Print download bit image	●	V
<GS B>	1D 42	Turn white/black reverse printing mode on/off	V	V
<GS H>	1D 48	Select printing position of HRI characters	V	V
<GS I>	1D 49	Transmit printer ID	V	Disabled
<GS L>	1D 4C	Set left margin	◎	Disabled
<GS P>	1D 50	Set basic calculated pitch	V	V
<GS V>	1D 56	Cut paper	◎	V
<GS W>	1D 57	Set printing area width	◎	▲

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<GS \>	1D 5C	Set relative vertical print position in page mode	Ignored	
<GS a>	1D 61	Enable/disable Automatic Status Back (ASB)	V	V
<GS f>	1D 66	Select font for HRI characters	V	V
<GS h>	1D 68	Set bar code height	V	V
<GS k>	1D 6B	Print bar code	●	V
<GS r>	1D 72	Transmit status	V	V
<GS v 0>	1D 76 30	Print raster bit image	●	Disabled
<GS w>	1D 77	Set bar code width	V	V

Two-dimensional Bar Code Commands

Control Codes	Hexadecimal Code	Function	Standard Mode	Page Mode
<DC2 ;>	12 3B	Specifies a module size of QR Code and Data Matrix	V	V
<GS p 1>	1D 70 01	Prints QR Code data based on the specified contents	V	V

Kanji Control Commands

(when the Japanese, Simplified Chinese, Traditional Chinese, or Korean model is used.)

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<FS !>	1C 21	Set print mode(s) for Kanji characters	V	V
<FS &>	1C 26	Select Kanji character mode	V	V
<FS ->	1C 2D	Turn underline mode on/off for Kanji characters	V	V
<FS .>	1C 2E	Cancel Kanji character mode	V	V
<FS S>	1C 53	Set Kanji character spacing	V	V
<FS W>	1C 57	Turn quadruple-size mode on/off for Kanji characters	V	V

Command classification
  Executing : Printer executes the command which does not affect the following data.
  Setting: Printer uses flags to make settings, and those settings affect the following data.

  ○: Enabled.
  ◎: Enabled only when the command is set at the beginning of a line.
  ●: Enabled only when data is not present in the printer buffer.
  ▲: Only value setting is possible.
  Disabled: Parameters are processed as printable data.
  Ignored: All command codes including parameters are ignored and nothing is executed.

COMMAND DETAILS

STANDARD COMMAND DETAILS

HT

[Name]	Horizontal tab
[Format]	ASCII HT Hex. 09 Decimal 9
[Range]	N/A
[Description]	Moves print position to next horizontal tab position. ● This command is ignored if the next tab is not set. ● If the next tab position exceeds the print region, the print position is moved to [print region + 1]. ● The horizontal tab position is set by ESC D (Set/cancel horizontal tab position). ● When the print position is at the [print region + 1] position and this command is received, the current line buffer full is printed and a horizontal tab is executed from the top of the next line. ● The initial value of the horizontal tab position is every 8 characters of Font A (the 9th, 17th, 25th positions, etc.)

LF

[Name]	Print and line feed
[Format]	ASCII LF Hex. 0A Decimal 10
[Range]	N/A
[Description]	Prints the data in the print buffer and performs a line feed based on the set line feed amount. ● After execution, makes the top of the line the next print starting position.

FF

[Name]	Print and recover to standard mode (in page mode)
[Format]	ASCII FF Hex. 0C Decimal 12
[Range]	N/A
[Description]	Prints all buffered data to the print region collectively, then recovers to the standard mode. ● All buffer data is deleted after printing. ● The print area set by ESC W (Set print region in page mode) is reset to the default setting. ● No paper cut is executed. ● Sets the print position to the beginning of the next line after execution. ● This command is enabled only in page mode.

CR

[Name]	Print and carriage return
[Format]	ASCII CR Hex. 0D Decimal 13
[Range]	N/A
[Description]	When an automatic line feed is enabled, this command functions in the same way as LF (print and line feed). When the automatic line feed is disabled, this command is ignored. ● This command is ignored with serial interface models. ● Sets the print position to the beginning of the next line after execution.

CAN

[Name]	Cancel print data in page mode
[Format]	ASCII CAN Hex. 18 Decimal 24
[Range]	N/A
[Description]	Deletes all print data in the currently set print region in page mode. ● This command is enabled only in page mode. ● Portions included in the currently set print region are also deleted, even if previously set print region data.

DLE EOT n

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

[Name]	Real-time request to printer.
[Format]	ASCII DLE ENQ n Hex. 10 05 n Decimal 16 5 n
[Range]	1 ≤ n ≤ 2
[Description]	Responds to requests n specifications from the host in real-time. n specifications are below. n = 1: Recover from the error and start printing from the line where the error

	occurred.
	n = 2: Recover from error after clearing the reception buffer and print buffer.
	This command is enabled even when the printer specification is disabled by ESC = (select
	peripheral devices).

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 FF

[Name]	Print data in page mode.
[Format]	ASCII ESC FF Hex. 1B 0C Decimal 27 12
[Range]	N/A

[Description]	Prints all buffered data in the print area collectively in page mode.
	● This command is enabled only in page mode.
	● Holds the following information after printing.
	  a. Expanded data
	  b. Character print direction selection in page mode (ESC T)
	  c. Set print region (ESC W) in the page mode.
	  d. Character expansion position

ESC SP n

[Name]	Set right-side character spacing.
[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 × [horizontal motion units].

ESC ! n

[Name]	Select print mode(s).
[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.

<table>
<thead>
<tr><th>Bit</th><th>On / Off</th><th>Hex</th><th>Decimal</th><th>Function</th></tr>
</thead>
<tbody>
<tr><td>0</td><td>Off</td><td>00</td><td>0</td><td>Character font A selected.</td></tr>
<tr><td></td><td>On</td><td>01</td><td>1</td><td>Character font B selected.</td></tr>
<tr><td>1</td><td>Off</td><td>00</td><td>0</td><td>Not used. Fixed to Off.</td></tr>
<tr><td>2</td><td>Off</td><td>00</td><td>0</td><td>Not used. Fixed to Off.</td></tr>
<tr><td>3</td><td>Off</td><td>00</td><td>0</td><td>Emphasized mode not selected.</td></tr>
<tr><td></td><td>On</td><td>08</td><td>8</td><td>Emphasized mode selected.</td></tr>
<tr><td>4</td><td>Off</td><td>00</td><td>0</td><td>Double-height mode not selected</td></tr>
<tr><td></td><td>On</td><td>10</td><td>16</td><td>Double-height mode selected</td></tr>
<tr><td>5</td><td>Off</td><td>00</td><td>0</td><td>Double-width mode not selected.</td></tr>
<tr><td></td><td>On</td><td>20</td><td>32</td><td>Double-width mode selected.</td></tr>
<tr><td>6</td><td>Off</td><td>00</td><td>0</td><td>Not used. Fixed to Off.</td></tr>
<tr><td>7</td><td>Off</td><td>00</td><td>0</td><td>Underline mode not selected.</td></tr>
<tr><td></td><td>On</td><td>80</td><td>128</td><td>Underline mode selected.</td></tr>
</tbody>
</table>

ESC $ nL nH

[Name]	Set absolute print position.
[Format]	ASCII ESC $ nL nH Hex. 1B 24 nL nH Decimal 27 36 nL nH
[Range]	0 ≤ (nL + nH x 256) ≤ 65535 (0 ≤ nH ≤ 255, 0 ≤ nL ≤ 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 x 256) x (vertical or horizontal motion units). Specifications exceeding the print range are ignored.

ESC * m nL nH d1…dk

[Name]	Select bit image mode
[Format]	ASCII ESC * m nL nH d1...dk Hex. 1B 2A m nL nH d1...dk Decimal 27 42 m nL nH d1...dk
[Range]	m = 0,1,32,33 0 ≤ nL ≤ 255 0 ≤ nH ≤ 3 0 ≤ d ≤ 255

<table>
<tr><td rowspan="6">[Description]</td><td colspan="6">Selects a bit-image mode in mode <i>m</i> for the number of dots specified by <i>nL</i> and <i>nH</i>.
m = 1,33 : (nL+nH×256)<576 (3 inch);(nL+nH×256)<432 (2 inch).
m = 0,32 : (nL+nH×256)<288 (3 inch);(nL+nH×256)<216 (2 inch).</td></tr>
<tr><td>m</td><td>Mode</td><td>Number of Vert. Dir. Dots</td><td>Density of Vert. Dir. Dots</td><td>Density of Hor. Dir. Dots</td><td>Data Count (k)</td></tr>
<tr><td>0</td><td>8 dot single density</td><td>8</td><td>67 DPI</td><td>101 DPI</td><td>nL+nH×256</td></tr>
<tr><td>1</td><td>8 dot double density</td><td>8</td><td>67 DPI</td><td>203 DPI</td><td>nL+nH×256</td></tr>
<tr><td>32</td><td>24 dot single density</td><td>24</td><td>203 DPI</td><td>101 DPI</td><td>(nL+nH×256)×3</td></tr>
<tr><td>33</td><td>24 dot double density</td><td>24</td><td>203 DPI</td><td>203 DPI</td><td>(nL+nH×256)×3</td></tr>
</table>

ESC - n

[Name]	Turn underline mode on/off.
[Format]	ASCII ESC - n Hex. 1B 2D n Decimal 27 45 n
[Range]	0 ≤ n ≤ 2 Initial Value n = 0

<table>
<tr><td rowspan="5">[Description]</td><td colspan="2">This command enables the print data following it to be printer out underlined.
The underline mode varied depending on the following values of n:</td></tr>
<tr><td>n</td><td>Function</td></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>
<tr><td>2</td><td>Turns on underline mode, set at 2-dot thick</td></tr>
</table>

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 ≤ n ≤ 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 ≤ n ≤ 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 D n1…nk NUL

[Name]	Set horizontal tab position
[Format]	ASCII ESC D n1...nk NUL Hex. 1B 44 n1...nk NUL Decimal 27 68 n1...nk NUL
[Range]	1 ≤ n ≤ 255 0 ≤ k ≤ 32
[Description]	Sets horizontal tab position ● n specifies the column number for setting a horizontal tab position from the left margin or the beginning of the line. ● k indicates the number of horizontal tab positions to be set.

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 as followings: When the LSB of n is 0, the emphasized mode is turned off. When the LSB of n is 1, the emphasized mode is turned on.

ESC G n

[Name]	Turn double-strike mode on/off.
[Format]	ASCII ESC G n Hex. 1B 47 n Decimal 27 71 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0
[Description]	Specifies or cancels double printing. Cancels double printing when n = <*******0>B.

	Specifies double printing when n = <*******1>B.
	● n is effective only when it is the lowest bit.
	● This printer is not capable of double printing, so the print is the same as when using emphasized printing.
	● This command is enabled for ANK characters

ESC J n

[Name]	Print and feed paper.
[Format]	ASCII ESC J n Hex. 1B 4A n Decimal 27 74 n
[Range]	$0 \le n \le 255$
[Description]	This command prints the data in the print buffer and feeds the paper [n X vertical motion unit]. ● Sets the print position to the beginning of the next line after printing. ● In standard mode, the printer uses the vertical motion unit (y). ● In page mode, this command functions as follows, depending on the starting position of the printable area: (1) When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the vertical motion unit (y) is used. (2) When the starting position is set to the upper right or lower left of the printable area using **ESC T**, the horizontal motion unit (x) is used. ● The maximum line spacing is 150mm {5.9 inches }. When the setting value exceeds the maximum, it is converted to the maximum automatically.

ESC L

[Name]	Select page mode
[Format]	ASCII ESC L Hex. 1B 4C Decimal 27 76
[Range]	N/A

[Description]	● Enabled only when input with the top of line.
	● Invalid when input by page mode.
	● Returns to standard mode after the following commands are issued.
	    a. FF (Print and recover to page mode)
	    b. ESC S (Select standard mode)
	● Character expansion position has the starting point specified by ESC T (Character print direction selection in page mode) in the printing region designated by the ESC W (Set print region in the page mode) command.
	● This command switches the settings for the following commands the values of which can be set independently in standard mode and page mode to those for page mode
	    a. Set space amount: ESC SP, FS S
	    b. Set line feed amount: ESC 2, ESC 3
	● The following commands are enabled only when in page mode.
	    a. ESC V : Specify/cancel character 90 degree clockwise rotation
	    b. ESC a : Position alignment
	    c. ESC { : Specify/cancel upside-down printing
	    d. GS W : Set print region width
	● The following command is ignored in page mode.
	    a. GS (A : Test print
	● The following commands are invalid in page mode.
	    a. FS p : Print NV bit image
	    b. FS q : Define NV bit image
	    c. GS v 0 : Print raster bit images
	    d. GS L : Set left margin
	● Recover to standard mode using ESC @ (initialize printer).

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 ANK character fonts using n as follows: <table><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>

ESC R n

[Name]	Select an international character set.
[Format]	ASCII ESC R n Hex. 1B 52 n Decimal 27 82 n
[Range]	0 ≤ n ≤ 16 Initial Value n = 0
[Description]	This command specifies international characters according to n values.

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

ESC S

[Name]	Select standard mode
[Format]	ASCII ESC S Hex. 1B 53 Decimal 27 83
[Range]	N/A
[Description]	● Valid only when input by page mode. ● All buffer data in page mode is deleted. ● Sets the print position to the beginning of the next line after execution. ● The print area set by ESC W (Set print region in page mode) is reset to the default setting. ● This command switches the settings for the following commands the values of which can be set independently in standard mode and page mode to those for standard mode 　a. ESC SP :Set character right space amount 　b. FS S :Set Chinese character space amount 　c. ESC 2 :Set default line spacing 　d. ESC 3 :Set line spacing ● The following commands are effective only when in standard mode. 　a. ESC W :Set print region in page mode 　b. ESC T :Select character print direction in page mode ● The following commands are ignored in standard mode. 　a.　GS $:Specify absolute position for character vertical direction in page Mode 　b.　GS \: :Specify relative position for character vertical direction in page mode ● Standard mode is selected when the power is turned on, the printer is reset or initialized (ESC @).

ESC T n

[Name]	Select print direction in page mode.		
[Format]	ASCII　ESC　T　n Hex.　　1B　54　n Decimal　27　84　n		
[Range]	0 ≤ n ≤ 3, 48 ≤ n ≤ 51 Initial Value n = 0		
[Description]	Selects the character printing direction and starting point in page mode.		
	n	Print Direction	Starting Point
	0, 48	Left to Right	Upper Left (A in the figure below)

1, 49	Bottom to Top	Lower Left (B in the figure below)
2, 50	Right to Left	Lower Right (C in the figure below)
3, 51	Top to Bottom	Upper Right (D in the figure below)
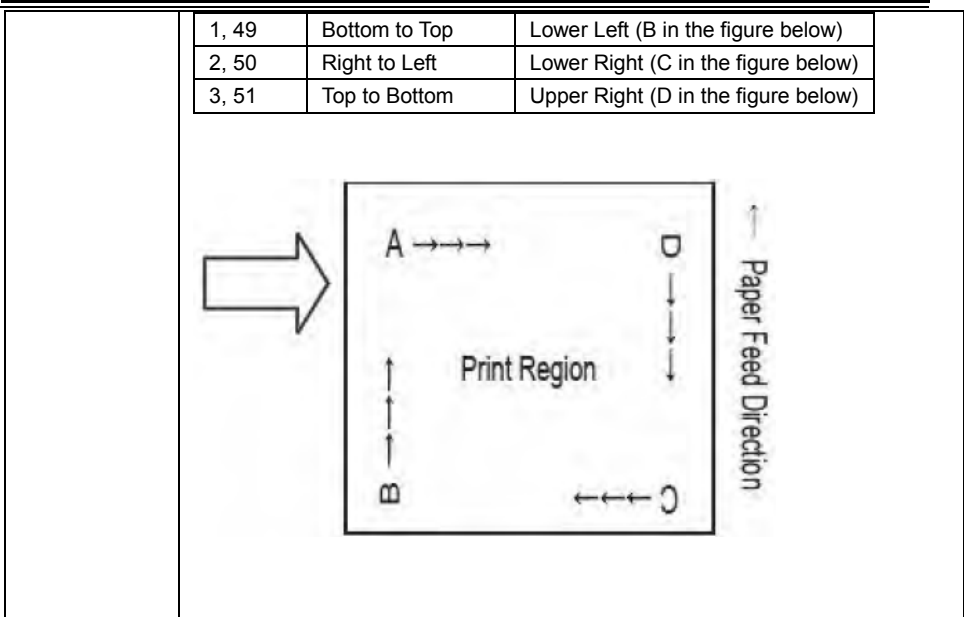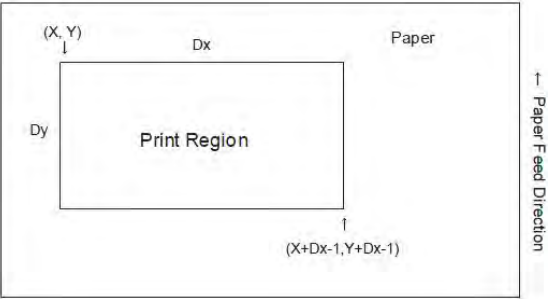
ESC V n

[Name]	Turn 90 degree clockwise rotation mode on/off
[Format]	ASCII ESC V n Hex. 1B 56 n Decimal 27 86 n
[Range]	0 ≤ n≤ 1, 48≤ n ≤49 Initial Value n = 0
[Description]	Specifies or cancels character 90 degree clockwise rotation.
n	Function
0, 48	Turns off 90 degree☐clockwise rotation mode
1, 49	Turns on 90 degree☐clockwise rotation mode

● Underlines are not applied to characters rotated 90 degrees clockwise even when ESC !,ESC - or FS - commands are given.
● If 90 degree clockwise rotation is specified, double-wide and double-tall commands in the 90 rotation mode enlarges characters in the opposite directions to double-wide and double-tall commands.
● This command only affects printing in standard mode.
● In page mode, this command is only effective for the setting.
● This command is effective for ANK and Chinese characters. |

ESC W xL xH yL yH dxL dxH dyL dyH

[Name]	Set printing area in page mode
[Format]	ASCII ESC W xL xH yL yH dxL dxH dyL dyH Hex. 1B 57 xL xH yL yH dxL dxH dyL dyH Decimal 27 87 xL xH yL yH dxL dxH dyL dyH
[Range]	0 ≤ xL, xH, yL, yH, dxL, dxH, dyL, dyH ≤ 255 However, this excludes dxL = dxH = 0 or dyL = dyH = 0 Initial Value xL = xH = yL = yH = 0
[Description]	Sets the print region position and size. ● Horizontal direction starting point [(xL + xH x 256) x basic calculated pitch] ● Vertical direction starting point [(yL + yH x 256) x basic calculated pitch] ● Horizontal direction length [(dxL + dxH x 256) basic calculated pitch] ● Vertical direction length = [(dyL + dyH x 256) basic calculated pitch] ● (X+Dx-1)<576 (3 inch, basic calculated pitch=1);(X+Dx-1)<432 (2 inch, basic calculated pitch=1) ● (Y+Dy-1)<768 (basic calculated pitch=1); ● If (horizontal starting position + printing area width) exceeds the printable area, the printing area width is automatically set to (horizontal printable area - horizontal starting position). ● If (vertical starting position + printing area height) exceeds the printable area, the printing area height is automatically set to (vertical printable area - vertical starting position).

ESC \ nL nH

[Name]	Set relative print position.
[Format]	ASCII ESC \ nL nH Hex. 1B 5C nL nH Decimal 27 92 nL nH
[Range]	0 ≤ (nL + nH x 256) ≤ 65535 (0 ≤ nL 255, 0 ≤ nH ≤ 255)
[Description]	Specifies the next print starting position with a relative position based on the current position. This sets the position from the current position to [(nL + nH x 256) x basic calculated pitch] for the next print starting position. ● Specifications exceeding the print range are ignored..

ESC a n

[Name]	Select justification.
[Format]	ASCII ESC a n Hex. 1B 61 n Decimal 27 97 n
[Range]	0 ≤ n ≤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><tr><td>n</td><td>Alignment</td></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> This command has no effect in page mode.

ESC c 3 n

[Name]	Select paper sensor(s) to output paper-end signals.			
[Format]	ASCII ESC c 3 n Hex. 1B 63 33 n Decimal 27 99 51 n			
[Range]	Specification: 0 ≤ n ≤ 3 Initial Value n = 0			
[Description]	Selects paper out detector that outputs a paper out signal when paper has run out.			

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

ESC c 4 n

[Name]	Select paper sensor(s) to stop printing.			
[Format]	ASCII ESC c 4 n Hex. 1B 63 34 n Decimal 27 99 52 n			
[Range]	Specification: 0 ≤ n ≤ 3 Initial Value n = 0			
[Description]	Selects the paper out detector to stop printing when paper has run out.			

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

ESC c 5 n

[Name]	Enable/disable panel buttons			
[Format]	ASCII	ESC	c	5	n
	Hex.	1B	63	35	n
	Decimal	27	99	53	n
[Range]	Specification: 0 ≤ n ≤ 255			
	Initial Value n = 0			
[Description]	Toggles the panel switches between enabled and disabled. ● Enables panel switches when n = <*******0>B. ● Disables panel switches when n = <*******1>B. ● n is effective only when it is the lowest bit. ● When disabled, all panel switches are disabled.			

ESC d n

[Name]	Print and feed n lines		
[Format]	ASCII	ESC	d	n
	Hex.	1B	64	n
	Decimal	27	100	n
[Range]	0 ≤ n ≤ 255		
[Description]	Prints the data in the print buffer and performs a paper feed of n lines. ● Sets the print position to the beginning of the next line after printing. ● Paper is fed approximately 150 mm if the [n x basic calculated pitch] exceeds approximately 150 mm (5.9 inches).		
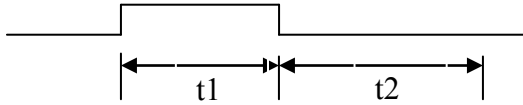
ESC i

[Name]	Full cut.		
[Format]	ASCII	ESC	i
	Hex.	1B	69
	Decimal	27	105
[Range]	N/A		
[Description]	This command executes a full cut of the paper in standard mode		

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 uncut in standard mode.		

ESC p m t1 t2

[Name]	General pulse.
[Format]	ASCII ESC p m t1 t2 Hex. 1B 70 m t1 t2 Decimal 27 112 m t1 t2
[Range]	$0 \le m \le 1, 48 \le m \le 49$ $0 \le t1 \le 255$ $0 \le t2 \le 255$
[Description]	This outputs a signal specified by t1 and t2 to the connector pin specified by m. Drawer kick on time is set to t1 x 2 ms; off time is set to t2 x 2 ms. {table and diagram below}

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]	$0 \le n \le 8$ Initial Value n = 0
[Description]	Select page n of the character code table. {table below}

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

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]	Specifies or cancels upside-down printing. ● Cancels upside-down printing when n = <*******0>H. ● Specifies upside-down printing when n = <*******1>H. ● n is effective only when it is the lowest bit. ● This command is effective only when input at the top of the line when standard mode is being used. ● This command has no effect in page mode. In page mode, this command is only effective for the setting. ● Upside-down printing rotates line data 180 degrees.

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]	Prints NV bit image n using mode m.

m	Mode
0, 48	Normal
1, 49	Double-width
2, 50	Double-height
3, 51	Quadruple

● n specifies the NV bit image number.
● m specifies the bit-image mode.
● NV bit image is a bit image defined in non-volatile memory by FS q and printed by this command.
● This command is ignored when the specified NV bit image n is undefined.

FS q n [xL xH yL yH d1…dk]1…[xL xH yL yH d1…dk]n

[Name]	Define NV bit image.
[Format]	ASCII FS q n [xL xH yL yH d1…dk]1…[xL xH yL yH d1…dk]n Hex. 1C 71 n [xL xH yL yH d1…dk]1…[xL xH yL yH d1…dk]n Decimal 28 113 n [xL xH yL yH d1…dk]1…[xL xH yL yH 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 $1 \leq (yL + yH \times 256) \leq 96$ $(0 \leq yL \leq 96, yH=0)$ $0 \leq d \leq 255$ $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$
[Description]	Defines the specified NV bit image. ● n specifies the number of NV bit images to define. ● xL and xH specify the horizontal direction for one NV bit image (xL + xH x 256) x 8 dots. ● yL and yH specify the vertical direction for one NV bit image (yL + yH x 256) x 8 dots.

GS ! n

[Name]	Select character size.		
[Format]	ASCII	GS	!	n
	Hex.	1D	21	n
	Decimal	29	33	n

[Range]	0 ≤ n ≤ 255
	(1 ≤ Vertical enlargement ≤ 8, 1 ≤ Horizontal enlargement ≤ 8)
	Initial Value n = 0

[Description]	This command selects the character height and width using bits 0 to 3, and bits 4 to 7 respectively as follows:

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		

Table 1 [Enlarged in horizontal direction]

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
70	112	8 times

Table 2 [Enlarged in vertical direction]

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

GS $ nL nH

[Name]	Set absolute vertical print position in page mode
[Format]	ASCII GS $ nL nH Hex. 1D 24 nL nH Decimal 29 36 nL nH
[Range]	$0 \leq nL \leq 255$, $0 \leq nH \leq 255$,
[Description]	Specifies the character vertical direction position for the data expansion starting position using the absolute position based on the starting point in page mode. The position of the character vertical direction for the next data expansion starting position is the position specified by [(nL + nH x 256) x basic calculated pitch] from the starting point. ● When not in page mode, this command is ignored. ● Specifications for absolute positions that exceed the specified print range are ignored.

GS * X   Y   [d1…d(X x Y x 8)]

[Name]	Define download bit images.
[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) $1 \leq Y \leq 96$ $0 \leq d \leq 255$

	Defines the download bit image of the number of dots specified by X and Y.
[Description]	● X specifies the number of bytes in the horizontal direction.
	● Y specifies the number of bytes in the vertical direction.
	● Horizontal direction dot count is X x 8 dots; Vertical direction dot count is Y x 8 dots
	● d indicates the bit-image data. Bits that correspond to the dots to print are 1, and the bits that correspond to the dots that are not printed are 0.

GS (A pL pH n m

[Name]	Execute test print.
[Format]	ASCII GS (A pL pH n m Hex. 1D 28 41 pL pH n m Decimal 29 40 65 pL pH n m
[Range]	$\{pL+ (pH \times 256)\} = 2$ (pL = 2, pH = 0) $0 \le n \le 2$, $48 \le n \le 50$ $2 \le m \le 3$, $50 \le m \le 51$
[Description]	Executes the specified test print. The following command is ignored in page mode. Specifies the parameter count following pL and pH in $(pL + (pH \times 256))$ bytes. *n* specifies the paper to be tested. _(see table below)_ *m* specifies a test pattern..

n specifies the paper to be tested.

n	Paper Type
0 , 48	Basic sheet (paper roll)
1 , 49	Paper Roll
2 , 50	

m specifies a test pattern..

m	Type of Test Print
2 , 50	Printer Status (Self Print)
3 , 51	Rolling Pattern Print

GS (K pL pH n m

[Name]	Set print density.					
[Format]	ASCII	GS	(	A	pL	pH	n	m
	Hex.	1D	28	4B	pL	pH	n	m
	Decimal	29	40	75	pL	pH	n	m
[Range]	{pL+ (pH×256) } = 2 (pL = 2,pH = 0)
	n = 49
	250 ≤ m ≤ 255, 0 ≤ m ≤ 6
	Initial Value m = 0
[Description]	Sets print density

m	Print Density
250	0.7
251	0.7
252	0.8
253	0.8
254	0.9
255	0.9
0	1.0
1	1.1
2	1.1
3	1.2
4	1.2
5	1.3
6	1.3

GS / m

[Name]	Print downloaded bit image.
[Format]	ASCII GS / m
	Hex. 1D 2F m
	Decimal 29 47 m
[Range]	0 ≤ m ≤ 3, 48 ≤ m ≤ 51
[Description]	This command prints the downloaded bit image defined by GS * according to the mode denoted by m.

m	Mode	Vertical dot density(DPI)	Horizontal dot density(DPI)
0 , 48	Normal	203	203
1 , 49	Double-width	203	101
2 , 50	Double-height	101	203
3 , 51	Quadruple	101	101

GS B n

[Name]	Turn 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]	Specifies or cancels black and white inverted printing. ● Cancels black and white inverted printing when n = <*******0>B. ● Specifies black and white inverted printing when n = <*******1>B. ● n is effective only when it is the lowest bit. ● Internal characters and download characters are targeted for black and white inverted printing. ● This command is effective for ANK and Chinese characters.

GS H n

[Name]	Select printing position of HRI characters.		
[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.		
	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]	Transmit 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]	Transmits the printer ID specified by *n* as follows: _see table below_

n	Printer ID Type	Specifications
1, 49	Model ID	MB-1030 or MP-1060
2, 50	Type ID	1030-XX or 1060-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 or MP-1060 System
67	Model Name	MB-1030 or MP-1060
68	Serial Number	Depends on the serial number
69	Chinese Character Types	Taiwan Language Characters: TW_BIG5 Japanese Language Characters: JP_SJIS Chinese Language Characters: CN_GB2312 Korean Language Characters: KO_EUC-KR

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 ≤ nL ≤ 255, 0 ≤ nH ≤ 255 Initial Value (nL + nH x 256)=0 (nL=0, nH=0)
[Description]	nL and nH set the specified left margin. The left margin is [(nL + nH x 256) x basic calculated pitch].

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 ≤ x ≤ 255 0 ≤ y ≤ 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 = 0,1,48,49,65,66 0 ≤ n ≤ 255	
[Description]	Executes specified paper cut.	
	m	Function
	0 , 48	Full cut
	1 , 49	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 W nL nH

[Name]	Set printing area width.
[Format]	ASCII GS W nL nH Hex. 1D 57 nL nH Decimal 29 87 nL nH
[Range]	0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255
[Description]	• Sets the print region width specified by nL and nH. • Print region width is [(nL + nH x 256) x basic calculated pitch]. • [(nL + nH x 256) x basic calculated pitch] >=24. Print Region Width Left Margin Printable Region

GS \ nL nH

[Name]	Set relative vertical print position in page mode.
[Format]	ASCII GS \ nL nH Hex. 1D 5C nL nH Decimal 29 92 nL nH
[Range]	0 ≤ nL ≤ 255 0 ≤ nH ≤ 255
[Description]	Specifies the character vertical direction position for the data expansion starting position using the relative position based on the current point in page mode. This sets the position moved from the current position to [(nL + nH x 256) x basic calculated pitch] for the next data expanding starting position. • When not in page mode, this command is ignored.

GS a n

[Name]	Enable/disable Automatic Status Back (ASB).
[Format]	ASCII GS a n Hex. 1D 61 n Decimal 29 97 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0

[Description]

Selects the statuses that are targeted for transmission with the automatic status function (ASB: Automatic Status Back).

Bits	Statuses Targeted for ASB	"0"	"1"
7	Undefined	---	---
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
6	On	40	64	Paper is being fed by the paper feed button
5	Off	00	0	Cover is close
5	On	20	32	Cover is open
4	On	10	16	Not used. Fixed to On
3	Off	00	0	On-line
3	On	08	8	Off-line
2	Off	00	0	Drawer kick-out connector pin 3 is LOW
2	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 font for HRI characters.	
[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 HRI character font when printing bar codes.	

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.
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
	   Hex. 1D 6B m n d1... dk
	   Decimal 29 107 m n d1... dk

[Range]	1. $0 \leq m \leq 6$ The definition region of k and d differ according to the bar code type. 2. $65 \leq m \leq 73$ The definition region of n and d differ according to the bar code type.
[Description]	Selects the bar code type and prints bar codes. 1:

1:

m	Bar Code Type	Defined region of k	Defined region of d
0	UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
1	UPC-E	$11 \leq k \leq 12$	$48 \leq d \leq 57$
2	JAN13 (EAN13)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
3	JAN8 (EAN8)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
4	CODE39	$1 \leq k \leq 255$	$48 \leq d \leq 57$, $65 \leq d \leq 90$, 32, 36, 37, 43, 45, 46, 47
5	ITF	$2 \leq k \leq 254$ (However, This is an even number.)	$48 \leq d \leq 57$
6	CODABAR	$1 \leq k \leq 255$	$48 \leq d \leq 57$, $65 \leq d \leq 68$, 36, 43, 45, 46, 47, 58

2:

m	Bar Code Type	Defined region of n	Defined region of d
65	UPC-A	$11 \leq n \leq 12$	$48 \leq d \leq 57$
66	UPC-E	$11 \leq n \leq 12$	$48 \leq d \leq 57$
67	JAN13 (EAN13)	$12 \leq n \leq 13$	$48 \leq d \leq 57$
68	JAN8 (EAN8)	$7 \leq n \leq 8$	$48 \leq d \leq 57$
69	CODE39	$1 \leq n \leq 255$	$48 \leq d \leq 57$, $65 \leq d \leq 90$, 32, 36, 37, 43, 45, 46, 47
70	ITF	$2 \leq n \leq 254$ (However, this is an even number.)	$48 \leq d \leq 57$
71	CODABAR	$1 \leq n \leq 255$	$48 \leq d \leq 57$, $65 \leq d \leq 68$, 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]	Transmit status.			
[Format]	ASCII GS r n Hex. 1D 72 n Decimal 29 114 n			
[Range]	n = 1, 2, 49, 50			
[Description]	Sends the specified status. Detector Status (n=1,49)			

Bit	Status	"0"	"1"
7	Fixed at 0		
6	Undefined		
5	Undefined		
4	Fixed at 0		
3	Paper roll end detector	Has Paper	Paper out
2	Paper roll end detector	Has Paper	Paper out
1	Paper roll near end detector	Has Paper	Paper out
0	Paper roll near end detector	Has Paper	Paper out

Drawer Kick Connector Status (n=2,50)

Bit	Status	"0"	"1"
7	Fixed at 0		
6	Undefined		
5	Undefined		
4	Fixed at 0		
3	Undefined		
2	Undefined		
1	Undefined		
0	Drawer kick connector pin #3	"L"	"H"

GS v 0 m xL xH yL yH d1 … dk

[Name]	Print raster bit image.								
	ASCII	GS	v	0	m	xL	xH	yL	yH	d1...dk
[Format]	Hex.	1D	76	30	m	xL	xH	yL	yH	d1...dk
	Decimal	29	118	48	m	xL	xH	yL	yH	d1...dk

[Range]	m = 0, m = 48 0 ≤ xL ≤ 54(for 2 inch) 0 ≤ xL ≤ 72(for 3 inch) 0 ≤ xH ≤ 0 0 ≤ yL ≤ 255 0 ≤ yH ≤ 3 0 ≤ d ≤ 255 k = (xL+xH×256) × (yL+yH×256) However, k ≠ 0

[Description]	Prints raster method bit images using mode m.

m	Mode	Density of Vert. Dir. Dots	Density of Hor. Dir. Dots
0, 48	Normal Mode	203 DPI	203 DPI

- xL and xH specify the horizontal direction data count for one bit image (xL + xH x 256) in bytes.
- yL and yH specify the vertical direction data count for one bit image (yL + yH x 256) in bytes.

[Ex.:]

GS w n

[Name]	Set bar code width.
[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

TWO-DIMENSIONAL BAR CODE COMMAND DETAILS

DC2 ; n

[Name]	QR Code Module Size Set
[Format]	ASCII DC ; n Hex. 12 3B n Decimal 18 59 n
[Range]	2 ≤ n ≤ 16 Initial Value n = 2
[Description]	Specifies a module size of QR Code and Data Matrix. n: The number of dots for one side of the module size.

GS p 1

[Name]	QR Code Print
[Format]	ASCII GS p 1 model e v mode nl nh [data] Hex. 1D 70 01 model e v mode nl nh [data] Decimal 29 112 01 model e v mode nl nh [data]
[Range]	model=01, 02 e=4Ch, 4Dh, 51h, 48h 0, $1 \leq v \leq 40$ mode=4Eh, 41h, 42h, 4Bh, 4Dh $1 \leq$ nh×256+nl$\leq$ 7089
[Description]	Prints QR Code data based on the specified contents. model: Specifies a model e: Selects an error correction level. 'L' (4CH), 'M' (4DH), 'Q' (51H), 'H' (48H) v: =0: Automatic selection (A version is automatically selected depending on the number of input data.)$1 \leq v \leq 40$ Fixed version (up to 14 for model-1) mode: Specifies a mode of data. <table><tr><th>Mode</th><th>Hexadecimal</th><th>Mode</th></tr><tr><td>N</td><td>4E</td><td>Numerical mode</td></tr><tr><td>A</td><td>41</td><td>Alphanumeric mode</td></tr><tr><td>B</td><td>42</td><td>8-bit byte mode</td></tr><tr><td>K</td><td>4B</td><td>Kanji mode</td></tr><tr><td>M</td><td>4D</td><td>Mixed mode</td></tr></table> nl, nh: Specifies the number of data. Data: Kanji data of the QR Code data should be set by Shift JIS code.

KANJI CONTROL COMMAND DETAILS

FS ! n

[Name]	Set print mode(s) for Kanji characters.			
[Format]	ASCII FS ! n Hex. 1C 21 n Decimal 28 33 n			
[Range]	0 ≤ n ≤ 255 Initial Value n = 0			
[Description]	Batch specifies the Kanji character print mode.			

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]	Select Kanji character mode.
[Format]	ASCII FS & Hex. 1C 26 Decimal 28 38
[Range]	N/A
[Description]	Specifies Kanji character mode.

FS - n

[Name]	Turn underline mode on/off for Kanji characters		
[Format]	ASCII FS - n Hex. 1C 2D n Decimal 28 45 n		
[Range]	0 ≤ n ≤ 2, 48 ≤ n ≤ 50		
[Description]	Specifies or cancels Kanji character underlines.		
	n	**Function**	
	0,48	Cancels Kanji character underline	
	1,49	Sets to one-dot width Kanji character underline and specifies Kanji character underlines.	
	2,50	Sets to two-dot width Kanji character underline and cancels Kanji character underlines.	

FS .

[Name]	Cancel Kanji character mode.
[Format]	ASCII FS . Hex. 1C 2E Decimal 28 46
[Range]	N/A
[Description]	Cancels Kanji character mode.

FS S n1 n2

[Name]	Set Kanji character spacing
[Format]	ASCII FS S n1 n2 Hex. 1C 53 n1 n2 Decimal 28 83 n1 n2
[Range]	0 ≤ n1 ≤ 255, 0 ≤ n2 ≤ 255 Initial Value n1 = 0, n2=0
[Description]	Sets the Kanji character space amount and right space amount. ● Left space amount: n1 x (basic calculated pitch) ● Right space amount: n2 x (basic calculated pitch)

FS W n

[Name]	Turn quadruple-size mode on/off for Kanji characters.
[Format]	ASCII FS W n Hex. 1C 57 n Decimal 28 87 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0
[Description]	Specifies or cancels quadruple size Kanji character. ● Cancels quadruple size when n = <*******0>B. ● Specifies quadruple size when n = <*******1>B. ● n is effective only when it is the lowest bit.

3.2.1.2 OPOS Printer Driver

The **MB1030_OposSetup.exe** program sets up the registry information of MSRHK reader for OPOS program uses.

1. Installation

The steps below guide you to install the **MB1030_OposSetup** program.

• Run the setup file **MB1030_OposSetup.exe** located in the Software folder of the CD.
• This setup also installs the **MB1030** program.
• Follow the wizard instructions to complete the installation.

2. Launching the Program

Follow the steps below to load the **MB1030** program:

• Click the *POSPrinter* folder from the path: *Start\Programs\Protech OPOS*.
• Click **MB1030** to launch the program.
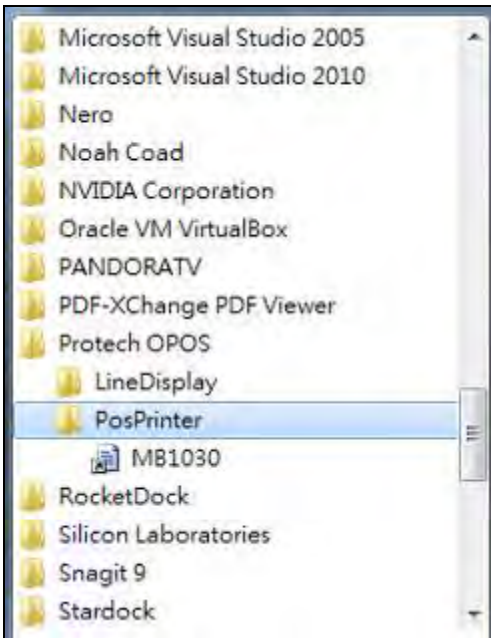
3. OPOS Control Object of **MB1030** Program

a.) Print tab buttons:

Button/Item	Description
Printer Normal	Print the string.

b.) Bitmap tab buttons/items:
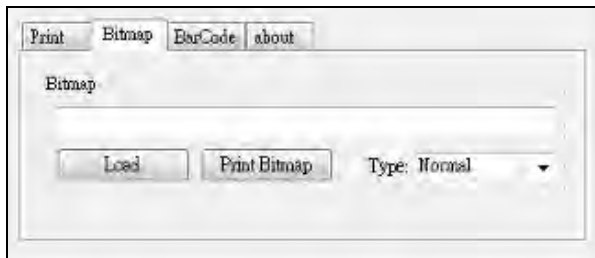
Button/Item	Description
Load	Load bitmap file.
Print Bitmap	Print bitmap file.
Type	Normal or Rotate 108˚.

c.) BarCode tab buttons/items:
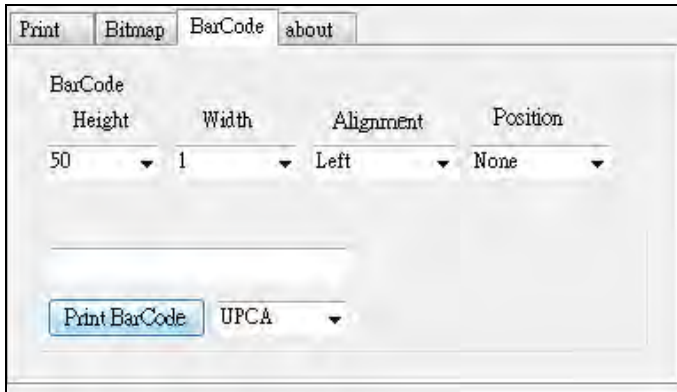
Button/Item	Description
Print BarCode	Print the barcode. Supported barcode types: UPCA, UPCE, EAN8, EAN13, ITF, Codabar, Code39, Code93, Code128
Alignment	Left, center or right
Position	Print barcode number (None, Above or Below)

4. MB1030 type

Key Name	Type	Default Value	Note
BaudRate	String	115200	UART Baud Rate (default)
BitLength	String	8	UART Data Bit (default)
Parity	String	0	UART Parity Bit (default)
Port	String	COM4	UART Port (default)
Stop	String	1	UART Stop Bit (default)

5. OPOS APIs Support List

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Properties	common bool	AutoDisable	R/W	1.2	Not Applicable
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Not Applicable
Properties	common string	CheckHealthText	Read only	1.0	Supported
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Not Applicable
Properties	common bool	DataEventEnabled	Read only	1.0	Not Applicable
Properties	common bool	DeviceEnabled	R/W	1.0	Not Applicable
Properties	common bool	FreezeEvents	R/W	1.0	Supported
Properties	common long	OpenResult	Read only	1.5	Supported
Properties	common bool	OutputID	Read only	1.0	Not Applicable
Properties	common bool	PowerNotify	R/W	1.3	Not Applicable
Properties	common bool	PowerState	Read only	1.3	Not Applicable
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Not Applicable
Properties	common long	State	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	common long	ControlObject Version	Read only	1.0	Not Applicable
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObject Version	Read only	1.0	Supported
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	specific long	CapCharacterSet	Read only	1.1	Not Applicable
Pro.perties	specific bool	CapConcurrentJrnRec	Read only	1.0	Not Applicable
Properties	specific bool	CapConcurrentJrnSlp	Read only	1.0	Not Applicable
Properties	specific bool	CapCoverSensor	Read only	1.0	Not Applicable
Properties	specific bool	CapTransaction	Read only	1.1	Not Applicable
Properties	specific bool	CapJrnPresent	Read only	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Properties	specific bool	CapJrn2Color	Read only	1.0	Not Applicable
Properties	specific bool	CapJrnBold	Read only	1.0	Not Applicable
Properties	specific long	CapJrnCartridgeSensor	Read only	1.5	Not Applicable
Properties	specific long	CapJrnColor	Read only	1.5	Not Applicable
Properties	specific long	CapJrnDhigh	Read only	1.0	Not Applicable
Properties	specific long	CapJrnDwide	Read only	1.0	Not Applicable
Properties	specific long	CapJrnDwideDhigh	Read only	1.0	Not Applicable
Properties	specific long	CapJrnEmptySensor	Read only	1.0	Not Applicable
Properties	specific long	CapJrnItalic	Read only	1.0	Not Applicable
Properties	specific long	CapJrnNearEndSensor	Read only	1.0	Not Applicable
Properties	specific bool	CapJrnUnderline	Read only	1.0	Not Applicable
Properties	specific bool	CapRecPresent	Read only	1.0	Not Applicable
Properties	specific bool	CapRec2Color	Read only	1.0	Not Applicable
Properties	specific bool	CapRecBarCode	Read only	1.0	Not Applicable
Properties	specific bool	CapRecBitmap	Read only	1.0	Not Applicable
Properties	specific bool	CapRecBold	Read only	1.0	Not Applicable
Properties	specific long	CapRecCartridgeSensor	Read only	1.5	Not Applicable
Properties	specific long	CapRecColor	Read only	1.5	Not Applicable
Properties	specific bool	CapRecDhigh	Read only	1.0	Not Applicable
Properties	Specific bool	CapRecDwide	Read only	1.0	Not Applicable
Properties	specific bool	CapRecDwideDhigh	Read only	1.0	Not Applicable
Properties	specific bool	CapRecEmptySensor	Read only	1.0	Not Applicable
Properties	specific bool	CapRecItalic	Read only	1.0	Not Applicable
Properties	specific bool	CapRecLeft90	Read only	1.0	Not Applicable
Properties	specific bool	CapRecMarkFeed	Read only	1.5	Not Applicable
Properties	specific bool	CapRecNearEndSensor	Read only	1.0	Not Applicable
Properties	specific bool	CapRecPapercut	Read only	1.0	Not Applicable
Properties	specific bool	CapRecRight90	Read only	1.0	Not Applicable
Properties	specific bool	CapRecRotate180	Read only	1.0	Not Applicable
Properties	specific bool	CapRecStamp	Read only	1.0	Not Applicable
Properties	specific bool	CapRecUnderline	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpPresent	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpFullslip	Read only	1.0	Not Applicable
Properties	specific bool	CapSlp2Color	Read only	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Properties	specific bool	CapSlpBarCode	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpBitmap	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpBold	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpBothSidesPrint	Read only	1.5	Not Applicable
Properties	specific long	CapSlpCartridgeSensor	Read only	1.5	Not Applicable
Properties	specific long	CapSlpColor	Read only	1.5	Not Applicable
Properties	specific bool	CapSlpDhigh	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpDwide	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpDwideDhigh	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpEmptySensor	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpItalic	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpLeft90	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpNearEndSensor	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpRight90	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpRotate180	Read only	1.0	Not Applicable
Properties	specific bool	CapSlpUnderline	Read only	1.0	Not Applicable
Properties	specific bool	AsyncMode	R/W	1.0	Not Applicable
Properties	specific long	CartridgeNotify	R/W	1.5	Not Applicable
Properties	specific long	CharacterSet	R/W	1.0	Not Applicable
Properties	specific string	CharacterSetList	Read only	1.0	Not Applicable
Properties	specific bool	CoverOpen	Read only	1.0	Not Applicable
Properties	specific long	ErrorLevel	Read only	1.1	Not Applicable
Properties	specific long	ErrorStation	Read only	1.0	Not Applicable
Properties	specific string	ErrorString	Read only	1.1	Not Applicable
Properties	specific string	FontTypefaceList	Read only	1.1	Not Applicable
Properties	specific bool	FlagWhenIdle	R/W	1.0	Not Applicable
Properties	specific long	MapMode	R/W	1.0	Not Applicable
Properties	specific long	RotateSpecial	R/W	1.1	Not Applicable
Properties	specific long	JrnLineChars	R/W	1.0	Not Applicable
Properties	specific string	JrnLineCharsList	Read only	1.0	Not Applicable
Properties	specific long	JrnLineHeight	R/W	1.0	Not Applicable
Properties	specific long	JrnLineSpacing	R/W	1.0	Not Applicable
Properties	specific long	JrnLineWidth	Read only	1.0	Not Applicable
Properties	specific bool	JrnLetterQuality	R/W	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Properties	specific bool	JrnEmpty	Read only	1.0	Not Applicable
Properties	specific bool	JrnNearEnd	Read only	1.0	Not Applicable
Properties	specific long	JrnCartridgeState	Read only	1.5	Not Applicable
Properties	specific long	JrnCurrentCartridge	R/W	1.5	Not Applicable
Properties	specific long	RecLineChars	R/W	1.0	Not Applicable
Properties	specific string	RecLineCharsList	Read only	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Properties	specific long	RecLineHeight	R/W	1.0	Not Applicable
Properties	specific long	RecLineSpacing	R/W	1.0	Not Applicable
Properties	specific long	RecLineWidth	Read only	1.0	Not Applicable
Properties	specific bool	RecLetterQuality	R/W	1.0	Not Applicable
Properties	specific bool	RecEmpty	Read only	1.0	Not Applicable
Properties	specific bool	RecNearEnd	Read only	1.0	Not Applicable
Properties	specific long	RecSidewaysMaxLines	Read only	1.0	Not Applicable
Properties	specific long	RecSidewaysMaxChars	Read only	1.0	Not Applicable
Properties	specific long	RecLinesToPaperCut	Read only	1.0	Not Applicable
Properties	specific string	RecBarCodeRotationList	Read only	1.1	Not Applicable
Properties	specific long	RecCartridgeState	Read only	1.5	Not Applicable
Properties	specific long	RecCurrentCartridge	R/W	1.5	Not Applicable
Properties	specific long	SlpLineChars	R/W	1.0	Not Applicable
Properties	specific string	SlpLineCharsList	Read only	1.0	Not Applicable
Properties	specific long	SlpLineHeight	R/W	1.0	Not Applicable
Properties	specific long	SlpLineSpacing	R/W	1.0	Not Applicable
Properties	specific long	SlpLineWidth	Read only	1.0	Not Applicable
Properties	specific bool	SlpLetterQuality	R/W	1.0	Not Applicable
Properties	specific bool	SlpEmpty	Read only	1.0	Not Applicable
Properties	specific bool	SlpNearEnd	Read only	1.0	Not Applicable
Properties	specific long	SlpSidewaysMaxLines	Read only	1.0	Not Applicable
Properties	specific long	SlpSidewaysMaxChars	Read only	1.0	Not Applicable
Properties	specific long	SlpMaxLines	Read only	1.0	Not Applicable
Properties	specific long	SlpLinesNearEndToEnd	Read only	1.0	Not Applicable
Properties	specific string	SlpBarCodeRotationList	Read only	1.1	Not Applicable
Properties	specific long	SlpPrintSide	Read only	1.5	Not Applicable
Properties	specific long	SlpCartridgeState	Read only	1.5	Not Applicable
Properties	specific long	SlpCurrentCartridge	R/W	1.5	Not Applicable
Methods	common	Open	_	1.0	Supported
Methods	common	Close	_	1.0	Supported
Methods	common	Claim	_	1.0	Supported
Methods	common	ClaimDevice	_	1.0	Supported
Methods	common	Release	_	1.0	Supported
Methods	common	ReleaseDevice	_	1.0	Supported
Methods	common	CheckHealth	_	1.0	Supported
Methods	common	ClearInput	_	1.0	Not Applicable
Methods	common	ClearOutput	_	1.0	Not Applicable
Methods	common	DirectIO	_	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	Printer .SO
Methods	specific	PrintNormal	–	1.0	Supported
Methods	specific	PrintTwoNormal	–	1.0	Not Applicable
Methods	specific	PrintImmediate	–	1.0	Not Applicable
Methods	specific	BeginInsertion	–	1.0	Not Applicable
Methods	specific	EndInsertion	–	1.0	Not Applicable
Methods	specific	BeginRemoval	–	1.0	Not Applicable
Methods	specific	EndRemoval	–	1.0	Not Applicable
Methods	specific	CutPaper	–	1.0	Supported
Methods	specific	RotatePrint	–	1.0	Supported (only 180)
Methods	specific	PrintBarCode	–	1.0	Supported
Methods	specific	PrintBitmap	–	1.0	Supported
Methods	specific	TransactionPrint	–	1.1	Not Applicable
Methods	specific	ValidateData	–	1.1	Not Applicable
Methods	specific	SetBitmap	–	1.0	Not Applicable
Methods	specific	SetLogo	–	1.0	Not Applicable
Methods	specific	ChangePrintSide	–	1.5	Not Applicable
Methods	specific	MarkFeed	–	1.5	Not Applicable
Events	common	DataEvent	–	1.0	Not Applicable
Events	common	DirectIOEvent	–	1.0	Not Applicable
Events	common	ErrorEvent	–	1.0	Not Applicable
Events	common	OutputComplete Event	–	1.0	Not Applicable
Events	common	StatusUpdate Event	–	1.0	Not Applicable

3.2.2 VFD: MB-4103 (RS-232)

3.2.2.1 Commands List

1. VFD Registry Operation

Registry Path:
[HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\LineDisplay\
MB4000]

Registry Name	Default Data	Notes
Default Value	MB4000_OPOS_SO.VFD.1	-
BaudRate	9600	-
BitLength	8	-
Parity	0	-
Port	COM1	-
Stop	1	-
Cts	0	
chk_hw	0	
Version	1.14	
Description	Protech Systems LineDisplay OPOS Service Object	

2. OPOS VFD Service Object and Method Relations

Method	Status of Support	Notes
Open	○	-
Close	○	-
ClaimDevice	○	-
ReleaseDevice	○	-
Enable	○	-
Disable	○	-
DisplayText	○	-
DisplayTextAt	○	-
ClearText	○	-

3.2.2.2 OPOS Driver

The **Setup.exe** program sets up the registry information and example program of VFD for OPOS program uses.

1. Installation

The steps below guide you to install the **MB4000_Opos** program:
• Run the "**Setup.exe** " setup file
• This setup also installs the **MB4000_Opos_Test** program.
• Follow the onscreen wizard instructions to complete the installation.

2. Launching the Program

The steps below guide you to load the **MB4000_Opos_Test** program:

• Click **MB4000_Opos_Test** to launch the program.

3. OPOS Control Object of **MB4000_Opos** program

Main screen:

Button/Item	Description
COM1(Default)	Which Port is connected to VFD
Open	Open OPOS Driver
Claim	Initial com port
Release	Un-initial com port
Close	Close OPOS Driver
CheckHealth	Check the status of service object

Message screen:
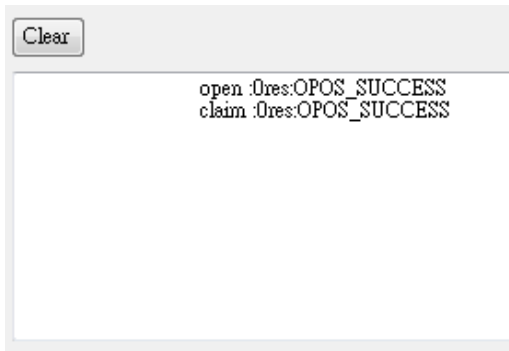
Button/Item	Description
Clear	Clear the message

Text screen:

Button/Item	Description
VFD Display (DisplayText)	Display the text at the current cursor position.
VFD Display At (DisplayTextAt)	Display the string of characters at the point of the specified "y-coordinate" and "x-coordinate".
VFD Clear (ClearText)	Clear the message shown in the current window.
Attribute	· **Normal:** Display the normal characters on the display screen. · **Blink:** Enable the display screen to blink. · **Reverse:** Enable the character printing in reverse black and white. · **Blink**+**Reverse:** Enable the display screen to blink and activate the character printing in reverse black and white.
Scroll text (ScrollText)	· Scroll the text at the current cursor position.
Attribute	· **LEFT:** Scroll the text to move to the left. · **RIGHT:** Scroll the text to move to the right.

DirectIO Screen:
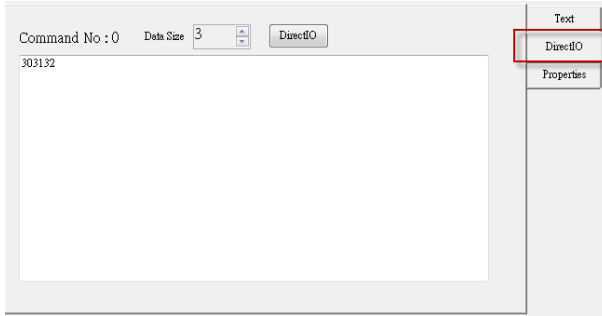
Button/Item	Description
DirectIO	Send the data to VFD
Data Size	Data length
Text Area	Type data on screen that will be send

General Properties screen:
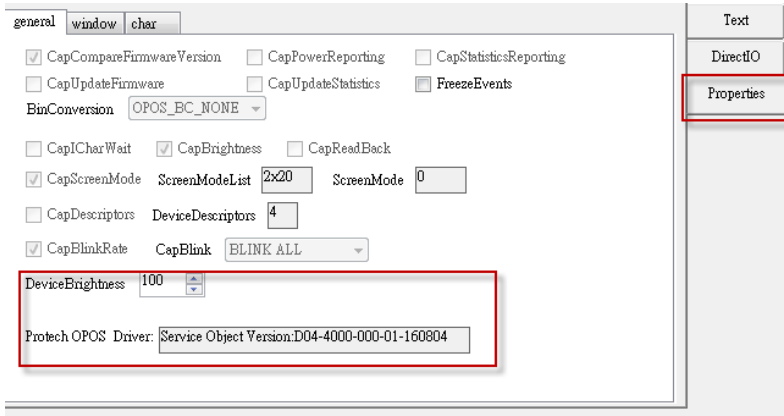
Button/Item	Description
Device Brightness	Set brightness for VFD
Protech OPOS Driver	Service Object Version

Window properties screen:
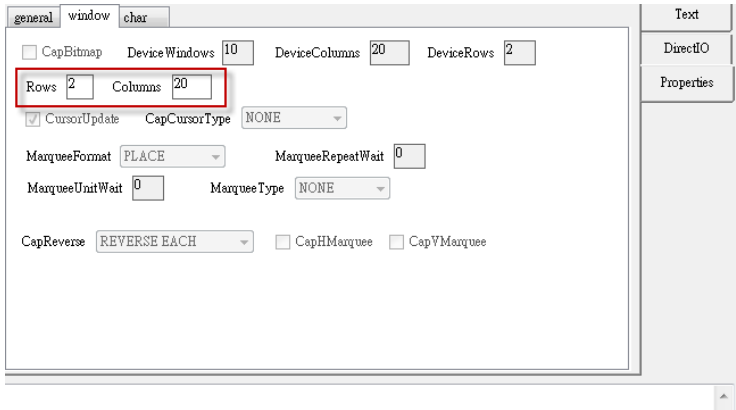
Item	Description
Rows	Rows of VFD
Columns	Columns of VFD

Character properties screen:
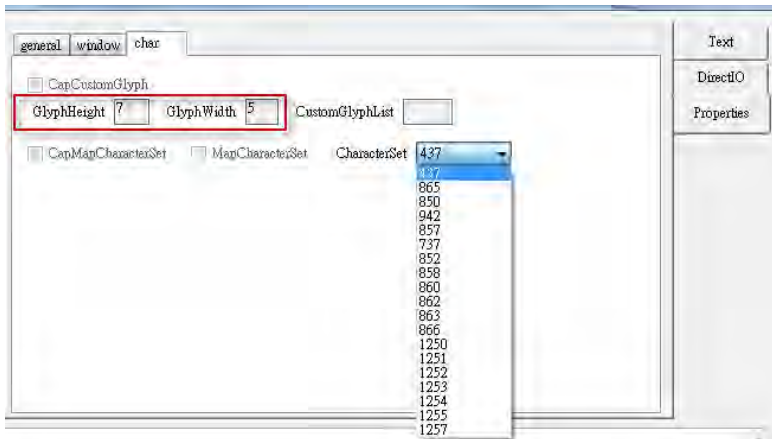
Item	Description
GlyphHeight	Height of character
GlyphWidth	Width of character
Character Set	Modify the codepage in VFD

4. MB4103 type

Key Name	Type	Default Value	Note
BaudRate	String	9600	UART Baud Rate (default)
BitLength	String	8	UART Data Bit (default)
Parity	String	0	UART Parity Bit (default)
Port	String	COM1	UART Port (default)
Stop	String	1	UART Stop Bit (default)

5. OPOS APIs Support List

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	common bool	AutoDisable	R/W	1.2	Not Applicable
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Not Applicable
Properties	common string	CheckHealthText	Read only	1.0	Supported
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Not Applicable
Properties	common bool	DataEventEnabled	Read only	1.0	Not Applicable
Properties	common bool	DeviceEnabled	R/W	1.0	Not Applicable
Properties	common bool	FreezeEvents	R/W	1.0	Not Applicable
Properties	common long	OpenResult	Read only	1.5	Not Applicable
Properties	common bool	OutputID	Read only	1.0	Not Applicable
Properties	common bool	PowerNotify	R/W	1.3	Not Applicable
Properties	common bool	PowerState	Read only	1.3	Not Applicable
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Not Applicable
Properties	common long	State	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	common long	ControlObject Version	Read only	1.0	Not Applicable
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObject Version	Read only	1.0	Supported
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	specific long	CapBlink	Read only	1.0	Not Applicable
Properties	specific bool	CapBlinkRate	Read only	1.6	Not Applicable
Properties	specific bool	CapBrightness	Read only	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	specific long	CapCharacterSet	Read only	1.0	Not Applicable
Properties	specific long	CapCursorType	Read only	1.6	Not Applicable
Properties	specific bool	CapCustomGlyph	Read only	1.6	Not Applicable
Properties	specific bool	CapDescriptors	Read only	1.0	Not Applicable
Properties	specific bool	CapHMarquee	Read only	1.0	Not Applicable
Properties	specific bool	CapICharWait	Read only	1.0	Not Applicable
Properties	specific long	CapReadBack	Read only	1.6	Not Applicable
Properties	specific long	CapReverse	Read only	1.6	Not Applicable
Properties	specific bool	CapVMarquee	Read only	1.0	Not Applicable
Properties	specific long	BlinkRate	R/W	1.6	Not Applicable
Properties	specific long	DeviceWindows	Read only	1.0	Not Applicable
Properties	specific long	DeviceRows	Read only	1.0	Not Applicable
Properties	specific long	DeviceColumns	Read only	1.0	Not Applicable
Properties	specific long	DeviceDescriptors	Read only	1.0	Not Applicable
Properties	specific long	DeviceBrightness	R/W	1.0	Not Applicable
Properties	specific long	CharacterSet	R/W	1.0	Not Applicable
Properties	specific string	CharacterSetList	Read only	1.0	Not Applicable
Properties	specific long	CurrentWindow	R/W	1.0	Not Applicable
Properties	specific long	Rows	Read only	1.0	Not Applicable
Properties	specific long	Columns	Read only	1.0	Not Applicable
Properties	specific long	CursorRow	R/W	1.0	Not Applicable
Properties	specific long	CursorColumn	R/W	1.0	Not Applicable
Properties	specific long	CursorType	R/W	1.6	Not Applicable
Properties	specific bool	CursorUpdate	R/W	1.0	Not Applicable
Properties	specific long	MarqueeType	R/W	1.0	Not Applicable
Properties	specific long	MarqueeFormat	R/W	1.0	Not Applicable
Properties	specific long	MarqueeUnitWait	R/W	1.0	Not Applicable
Properties	specific long	MarqueeRepeatWait	R/W	1.0	Not Applicable
Properties	specific long	InterCharacterWait	R/W	1.0	Not Applicable
Properties	specific string	CustomGlyphList	Read only	1.6	Not Applicable
Properties	specific long	GlyphHeight	Read only	1.6	Not Applicable
Properties	specific long	GlyphWidth	Read only	1.6	Not Applicable
Methods	common	Open	-	1.0	Supported
Methods	common	Close	-	1.0	Supported
Methods	common	Claim	-	1.0	Supported
Methods	common	ClaimDevice	-	1.0	Supported
Methods	common	Release	-	1.0	Supported
Methods	common	ReleaseDevice	-	1.0	Supported
Methods	common	CheckHealth	-	1.0	Not Applicable
Methods	common	ClearInput	-	1.0	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Methods	common	ClearOutput	-	1.0	Not Applicable
Methods	common	DirectIO	-	1.0	Not Applicable
Methods	specific	DisplayText	-	1.0	Supported
Methods	specific	DisplayTextAt	-	1.0	Supported
Methods	specific	ClearText	-	1.0	Supported
Methods	specific	ScrollText	-	1.0	Supported
Methods	specific	SetDescriptor	-	1.0	Not Applicable
Methods	specific	ClearDescriptors	-	1.0	Not Applicable
Methods	specific	CreateWindow	-	1.0	Not Applicable
Methods	specific	DestroyWindow	-	1.0	Not Applicable
Methods	specific	RefreshWindow	-	1.0	Not Applicable)
Methods	specific	ReadCharacterAtCursor	-	1.6	Not Applicable
Methods	specific	DefineGlyph	-	1.6	Not Applicable
Events	common	DataEvent	-	1.0	Not Applicable
Events	common	DirectIOEvent	-	1.0	Not Applicable
Events	common	ErrorEvent	-	1.0	Not Applicable
Events	common	OutputComplete Event	-	1.0	Not Applicable
Events	common	StatusUpdate Event	-	1.3	Not Applicable

3.2.2.3 OPOS VFD Register

The **OPOS VFD Register** program sets up the registry information of VFD for OPOS program usage.

1. Launching the Program

The steps below guide you to load the **VFD_Register** program:

• **VFD_Register** to launch the program.

Main screen:
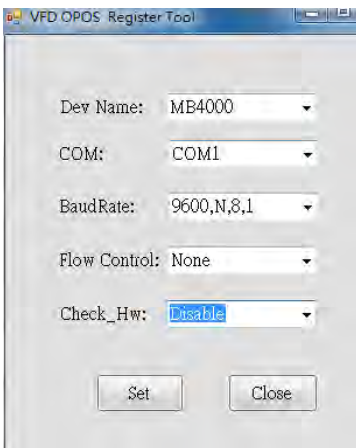
Item	Description
Dev Name	The VFD module name: MB4000
COM	Which port do you want to connect device
Bud Rate	Baud rate: (1) 9600,N,8,1 (2) 19200,N,8,1
Flow Control	CTS enable or None
Check_Hw	Enable or disable

3.2.3   MSR: MB-3102 (PS/2)

3.2.3.1   OPOS Driver
The **MB3012_OposSetup.exe** program sets up the registry information of the MSR reader for OPOS programming use.

1.   Installation

The steps below guide you to install the **MB3012_OposSetup** program.

• Run the **Setup.exe** setup file.
• Follow the wizard instructions to complete the installation.

2.   Launching the Program

The steps below guide you to load the **MB3012_Opos** program.

• Click the *MSR* folder from the path: *Start/Programs/Protech OPOS*.
• Click **D04-3012-000-00-160311** to launch the program.
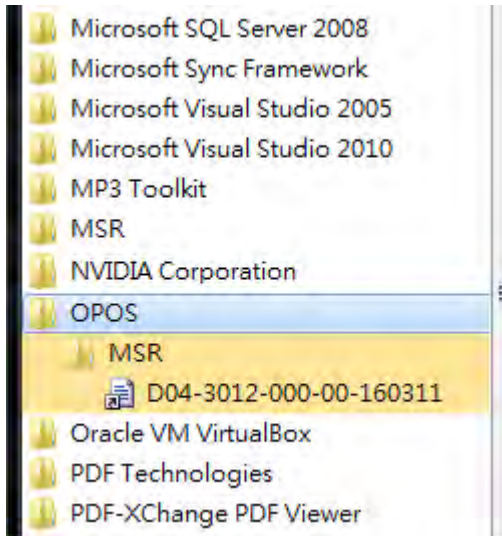
3.   Configuration of **Prox-PMP3000** program

a.)   Main screen & Control tab items:
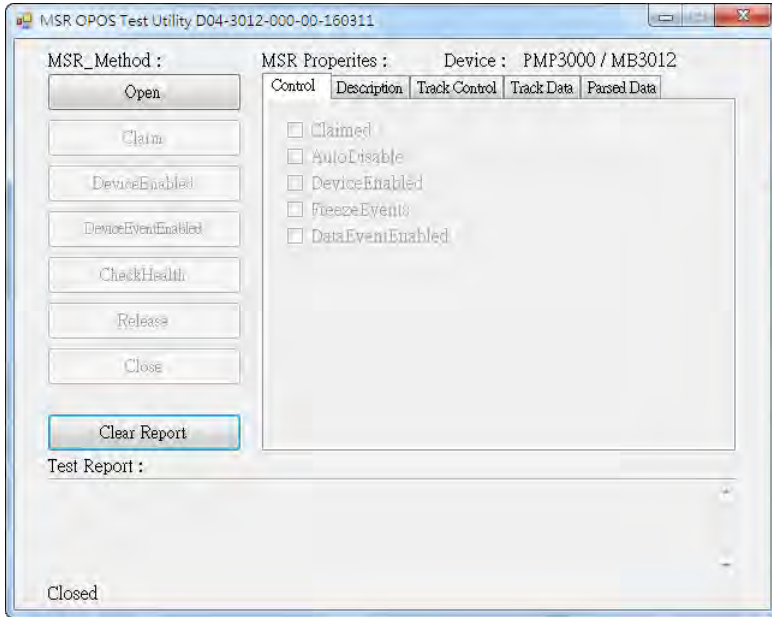
Button/Item	Description
COM	Select the COM port number from the drop-down list. (only for UART/USB interface).
AutoDisable	(check box) Check to disable the device automatically when data is received.
FreezeEvents	(check box) Enable to trigger *FreezeEvents*, and the application will not allow events to be delivered.

b.) Description tab: S.O and C.O information

c.) Track Control tab items

Button/Item	Description
DecodeData	Set decode data properties applicable.
ParseDecodeData	Set parse decode data properties
TransmitSentinels	Set transmit-sentinels properties
ErrorReporting Type	Card, track
TracksToRead	Track1, track2, track3, tracks12, tracks13, tracks14, tracks23, tracks24, tracks34, tracks123, tracks124, tracks134, tracks234, tracks1234 (Tracks4 is not applicable).

d.) Track Data tab items
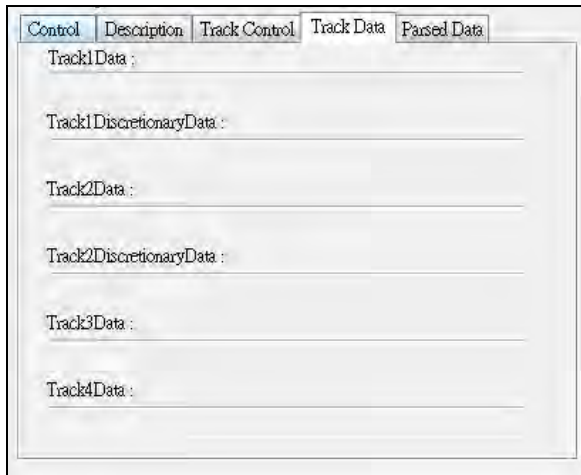
Button/Item	Description
TracksData	(Row) Display the data of all tracks (Track4 is not applicable).

e.) Parsed Data tab items

Button/Item	Description
Parsed Data	Display special properties.

4. MB301X type (RS232/PS2)

Key Name	Type	Default Value	Note
default	string	PMP3000	OPOS S.O Link

5. OPOS APIs support List

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	common bool	AutoDisable	R/W	1.2	Supported
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Supported
Properties	common string	CheckHealthText	Read only	1.0	Supported
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Supported
Properties	common bool	DataEventEnabled	R/W	1.0	Supported
Properties	common bool	DeviceEnabled	R/W	1.0	Supported
Properties	common bool	FreezeEvents	R/W	1.0	Supported
Properties	common long	OpenResult	Read only	1.5	Supported
Properties	common long	OutputID	Read only	1.0	Not Applicable
Properties	common long	PowerNotify	R/W	1.3	Not Applicable
Properties	common long	PowerState	Read only	1.3	Not Applicable
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Supported
Properties	common long	State	Read only	1.0	Not Applicable
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	common long	ControlObjectVersion	Read only	1.0	Not Applicable
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObjectVersion	Read only	1.0	Not Applicable
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	DeviceName	Read only	1.0	Supported
Properties	specific bool	CapISO	Read only	1.0	Supported
Properties	specific bool	CapJISOne	Read only	1.0	Supported
Properties	specific bool	CapJISTwo	Read only	1.0	Supported
Properties	specific bool	CapTransmitSentinels	Read only	1.5	Supported
Properties	specific long	TracksToRead	R/W	1.0	Supported
Properties	specific bool	DecodeData	R/W	1.0	Not Applicable
Properties	specific bool	ParseDecodeData	R/W	1.0	Supported

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	specific long	ErrorReportType	R/W	1.2	Not Applicable
Properties	specific string	Track1Data	Read only	1.0	Supported
Properties	specific string	Track2Data	Read only	1.0	Supported
Properties	specific string	Track3Data	Read only	1.0	Supported
Properties	specific string	Track4Data	Read only	1.5	Not Applicable
Properties	specific string	AccountNumber	Read only	1.0	Supported
Properties	specific string	ExpirationDate	Read only	1.0	Supported
Properties	specific string	Title	Read only	1.0	Supported
Properties	specific string	FirstName	Read only	1.0	Supported
Properties	specific string	MiddleInitial	Read only	1.0	Supported
Properties	specific string	Surname	Read only	1.0	Supported
Properties	specific string	Suffix	Read only	1.0	Supported
Properties	specific string	ServiceCode	Read only	1.0	Supported
Properties	specific binary	Track1 DiscretionaryData	Read only	1.0	Supported
Properties	specific binary	Track2 DiscretionaryData	Read only	1.0	Supported
Properties	specific bool	TransmitSentinels	R/W	1.5	Supported
Methods	common	Open	-	1.0	Supported
Methods	common	Close	-	1.0	Supported
Methods	common	Claim	-	1.0	Supported
Methods	common	ClaimDevice	-	1.5	Supported
Methods	common	Release	-	1.0	Supported
Methods	common	ReleaseDevice	-	1.5	Supported
Methods	common	CheckHealth	-	1.0	Not Applicable
Methods	common	ClearInput	-	1.0	Supported
Methods	common	ClearOutput	-	1.0	Not Applicable
Methods	common	DirectIO	-	1.0	Not Applicable
Events	common	DataEvent	-	1.0	Supported
Events	common	DirectIOEvent	-	1.0	Not Applicable
Events	common	ErrorEvent	-	1.0	Not Applicable
Events	common	OutputCompleteEvent	-	1.0	Not Applicable
Events	common	StatusUpdateEvent	-	1.0	Not Applicable

3.2.4   MSR: GIGA-TMS MJR243 (RS-232)

3.2.4.1   Commands List

1.   MSR Registry Operation

Registry Path:
[HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\
MSR\MJR243]

Registry Name	Default Data	Notes
CapISO	1	Capability for reading ISO track data
CapJISOne	1	(reserved)
CapJISTwo	1	(reserved)
CapTransmitSentinels	1	Capability for reading Transmit Sentinels
Debug	0	Enable the tracing and create a log file
Description	GIGATMS MSR POS	Description for SO driver
DeviceName	MJR243	Device Name for CO open
FileName	(NULL)	(reserved)
HardwareProvider	0	(reserved)
Model	MJR243	Device model name
Parity	None	Parity for the communication port
Port	COM4	COM Port
Protocol	Hardware	Communication Control
Baudrate	19200	RS-232 baudrate

2. OPOS MSR Service Object and Method Relations

Method	Status of support by the driver	Notes
Open	○	-
Close	○	-
Claim	○	-
ClaimDevice	○	-
Release	○	-
ReleaseDevice	○	-
ClearInput	○	-
ClearInputProperties	○	-
DataEvent	○	-
Claimed	○	Read only
DataCount	○	Read only
DataEventEnabled	○	R/W
DeviceEnabled	○	R/W
FreezeEvents	○	R/W
OpenResult	○	Read only
ResultCode	○	Read only
ResultCodeExtended	○	Read only
State	○	Read only
ControlObjectDescription	○	Read only
ControlObjectVersion	○	Read only
ServiceObjectDescription	○	Read only
ServiceObjectVersion	○	Read only
DeviceDescription	○	Read only
DeviceName	○	Read only
CapISO	○	Read only
CapTransmitSentinels	○	Read only
AccountNumber	○	Read only
DecodeData	○	R/W
ExpirationDate	○	Read only
FirstName	○	Read only
MiddleInitial	○	Read Only
ParseDecodeData	○	R/W
ServiceCode	○	Read Only
Suffix	○	Read Only
Surname	○	Read Only
Title	○	Read Only
Track1Data	○	Read Only

Method	Status of support by the driver	Notes
Track1DiscretionaryData	○	Read Only
Track2Data	○	Read Only
Track2DiscretionaryData	○	Read Only
Track3Data	○	Read Only
TracksToRead	○	R/W
TransmitSentinels	○	R/W

3.2.4.2   OPOS MSR Register

The **OPOS MSR Register** program sets up the registry information of MSRHK reader for OPOS program usage.

1.   Installation

The steps below guides you how to install the **OPOS MSR Register** program.
• Insert the setup CD
• Run the setup file **OPOSMSR_Setup.exe** located in the Software folder of the CD.
• This setup also installs the **OPOS MSR Tester** program.
• Follow the wizard instructions to complete the installation.

2.   Launching the Program

The steps below guides you how to load the **OPOS MSR Register** program.

• Click the *OPOS* folder from the path: *Start/Programs/GIGA-TMS*.
• Click **OPOS MSR Register** to launch the program.
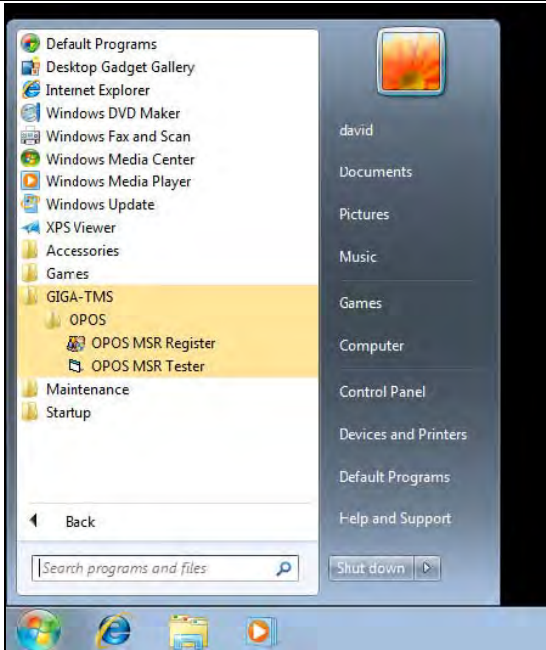
3. Configuration of **OPOS MSR Register** program

a.) Main screen buttons/items:

Button/Item	Description
Control Object	(Check box) Register the OPOSMSR.ocx common control object driver. The item needs to be checked to run the OPOS MSR Tester program.
Service Object	(Left pane) The Service Object driver types. So far only four driver types are supported. Each driver type supports specific MSR readers. Please refer to the OPOS MSR Service Object and Method Relations section for details.
Service Object	(Right pane) The registered MSR with the specified device name.
Reg→	Create a new device name for the selected MSR.
← Unreg	Remove the selected device name from the registry.
Exit	Quit the program.

b.) Follow the steps below to register the MSRHK OPOS information:
    Step 1: Select an item in the **Service Object** List box from the left pane. Make
          sure the correct item is selected.
    Step 2: Click **Reg→** button
    Step 3: In the **OPOS MSR Setting** screen, enter the device name and click **OK**.

c.) Example 1. MAGTEK USB HID
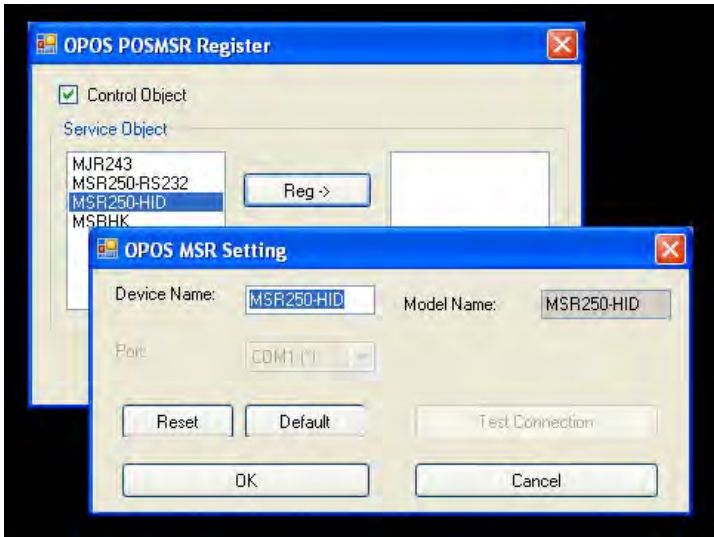
d.) Example 2. PROMAG MSR/MJR PART-NO, Keyboard mode.
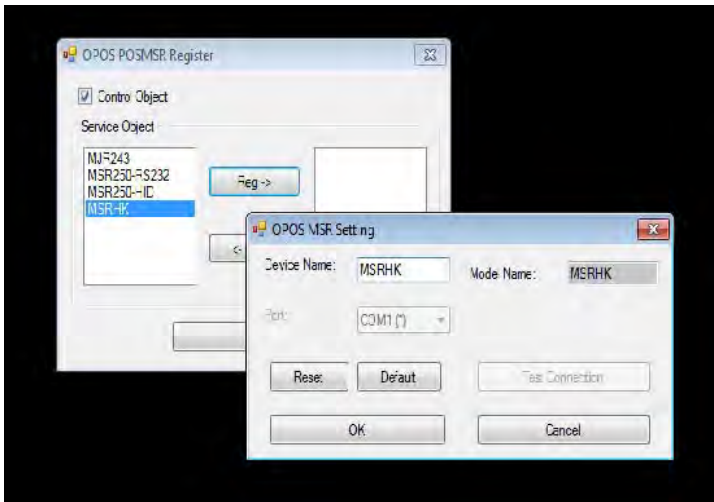
e.) Example 3. PROGRAM MSR PART-NO, HID mode.

If your system doesn't have any other common control driver, click the Control Object check box.

Note: To run the **OPOPS MSR Tester** program, the Control Object must be checked.

4. MJR243 type

Key Name	Type	Default Value	Note
CapISO	string	1	Capability for reading ISO track data
CapJISOne	string	1	(reserved)
CapJISTwo	string	1	(reserved)
CapTransmitSentinels	string	1	Capability for reading Transmit Sentinels
Debug	string	0	Enable the tracing and create a log file.
Description	string	GIGATMS MSR POS	Description for SO driver
DeviceName	string	MJR243	Device Name for CO open
FileName	string	(NULL)	(reserved)
HardwareProvider	string	0	(reserved)
Model	string	MJR243	Device model name

Key Name	Type	Default Value	Note
Parity	string	None	Parity for the communication port
Port	string	COM4	COM Port Number
Protocol	string	Hardware	Communication Control
Baudrate	string	19200	RS-232 baudrate

5. OPOS APIs support list

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Properties	common bool	AutoDisable	R/W	1.2	Not Applicable
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common bool	CapCompare FirmwareVersion	Read only	1.9	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Not Applicable
Properties	common bool	CapStatisticsReporting	Read only	1.8	Not Applicable
Properties	common bool	CapUpdateFirmware	Read only	1.9	Not Applicable
Properties	common bool	CapUpdateStatistics	Read only	1.8	Not Applicable
Properties	common string	CheckHealthText	Read only	1.0	Not Applicable
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Supported
Properties	common bool	DataEventEnabled	R/W	1.0	Supported
Properties	common bool	DeviceEnabled	R/W	1.0	Supported
Properties	common bool	FreezeEvents	R/W	1.0	Supported
Properties	common long	OpenResult	Read only	1.5	Supported
Properties	common long	OutputID	Read only	1.0	Not Applicable
Properties	common long	PowerNotify	R/W	1.3	Not Applicable
Properties	common long	PowerState	Read only	1.3	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Supported
Properties	common long	State	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Supported
Properties	common long	ControlObjectVersion	Read only	1.0	Supported
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObjectVersion	Read only	1.0	Supported
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	DeviceName	Read only	1.0	Supported
Properties	specific bool	CapISO	Read only	1.0	Supported
Properties	specific bool	CapJISOne	Read only	1.0	Not Applicable
Properties	specific bool	CapJISTwo	Read only	1.0	Not Applicable
Properties	specific bool	CapTransmit Sentinels	Read only	1.5	Supported
Properties	specific long	CapWriteTracks	Read only	1.1	Not Applicable
Properties	specific string	AccountNumber	Read only	1.0	Supported
Properties	specific bool	DecodeData	R/W	1.0	Supported
Properties	specific long	EncodingMaxLength	Read only	1.1	Not Applicable
Properties	specific long	ErrorReportType	R/W	1.2	Not Applicable
Properties	specific string	ExpirationDate	Read only	1.0	Supported
Properties	specific string	FirstName	Read only	1.0	Supported
Properties	specific string	MiddleInitial	Read only	1.0	Supported
Properties	specific bool	ParseDecodeData	R/W	1.0	Supported
Properties	specific string	ServiceCode	Read only	1.0	Supported

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Properties	specific string	Suffix	Read only	1.0	Supported
Properties	specific string	Surname	Read only	1.0	Supported
Properties	specific string	Title	Read only	1.0	Supported
Properties	specific binary	Track1Data	Read only	1.0	Supported
Properties	specific binary	Track1 DiscretionaryData	Read only	1.0	Supported
Properties	specific binary	Track2Data	Read only	1.0	Supported
Properties	specific binary	Track2 DiscretionaryData	-	1.0	Supported
Properties	specific binary	Track3Data	Read only	1.0	Supported
Properties	specific binary	Track4Data	Read only	1.5	Not Applicable
Properties	specific long	TracksToRead	R/W	1	Supported
Properties	specific long	TracksToWrite	R/W	1.1	Not Applicable
Properties	specific bool	TransmitSentinels	R/W	1.5	Supported
Methods	common	Open	-	1	Supported
Methods	common	Close	-	1	Supported
Methods	common	Claim	-	1	Supported
Methods	common	ClaimDevice	-	1.5	Supported
Methods	common	Release	-	1	Supported
Methods	common	ReleaseDevice	-	1.5	Supported
Methods	common	CheckHealth	-	1	Not Applicable
Methods	common	ClearInput	-	1	Supported
Methods	common	ClearInput Properties	-	1.1	Supported
Methods	common	ClearOutput	-	1	Not Applicable
Methods	common	DirectIO	-	1	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Methods	common	Compare FirmwareVersion	-	1.9	Not Applicable
Methods	common	ResetStatistics	-	1.8	Not Applicable
Methods	common	RetrieveStatistics	-	1.8	Not Applicable
Methods	common	UpdateFirmware	-	1.9	Not Applicable
Methods	common	UpdateStatistics	-	1.8	Not Applicable
Events	common	DataEvent	-	1.0	Supported
Events	common	DirectIOEvent	-	1.0	Not Applicable
Events	common	ErrorEvent	-	1.0	Not Applicable
Events	common	OutputCompleteEvent	-	1.0	Not Applicable
Events	common	StatusUpdateEvent	-	1.0	Not Applicable

3.2.4.3   OPOS MSR Tester

The **OPOS MSR Tester** program is used to get the track data of the MSRHK reader via the OPOS driver. Before running the program, make sure the device name registry information for MSRHK reader has been created by OPOS MSR Register program.

1.   **Installation**
       The installation of **OPOS MSR Tester** program goes together with OPOS MSR Register program.

2.   **Launching the Program**

       The steps below guide you to load the **OPOS MSR Tester** program.

       • Click the *OPOS* folder from the path: *Start\Programs\GIGA -TMS*.
       • Click **OPOS MSR Tester** to launch the program.
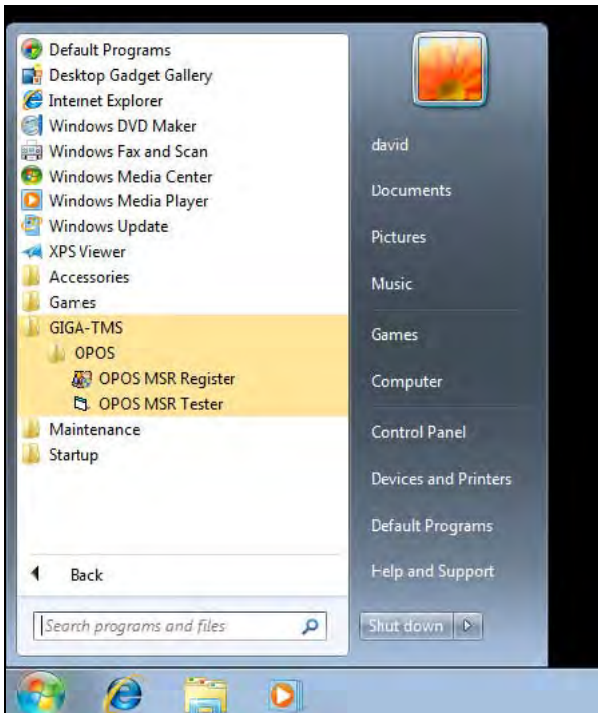
3. Configuration for OPOS MSR Tester Program

a.) Main screen buttons/items:
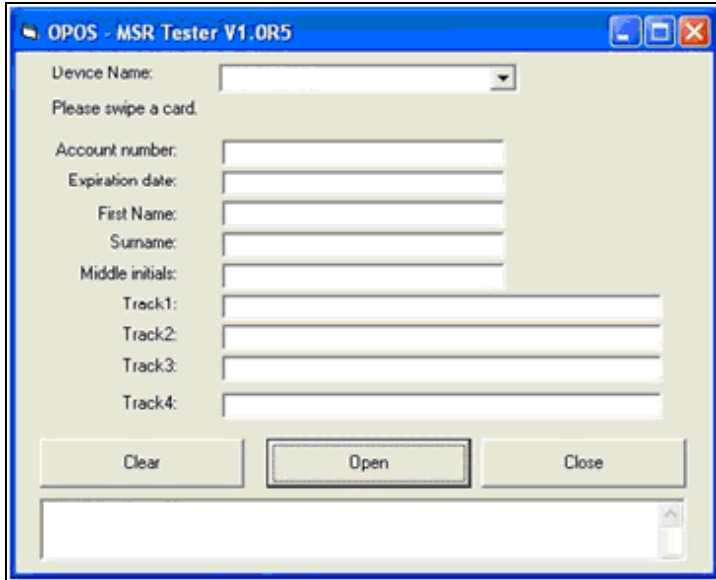
Button/Item	Description
Device Name	(Combo box) Enter the device name that will be loaded to the program.
Track Data	(Text boxes) Show the raw and parsed track data.
Clear	(Button) Clear all the track data in the text boxes.
Open	(Button) Open the OPOS driver and ready to get track data.
Close	(Button) Close the OPOS driver.
Message	(Text box) Display the result message of running the OPOS driver.

b.) To get the track data using OPOS driver, follow the steps below:

Step 1: Enter the **Device Name**.

Step 2: Click **Open** button.

Step 3: Swipe the card to get the track data.

c.) Example 1. MAGTEK USB HID.
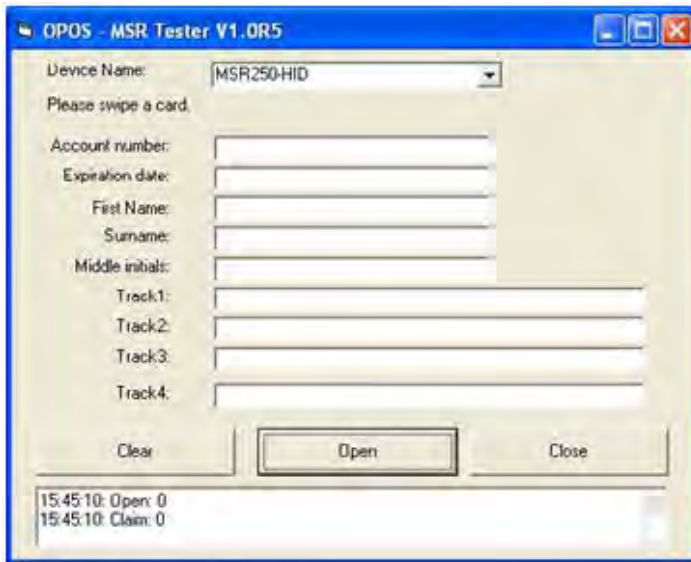
d.) Example 2. PROMAG MSR/MJR PART‑NO, Keyboard mode
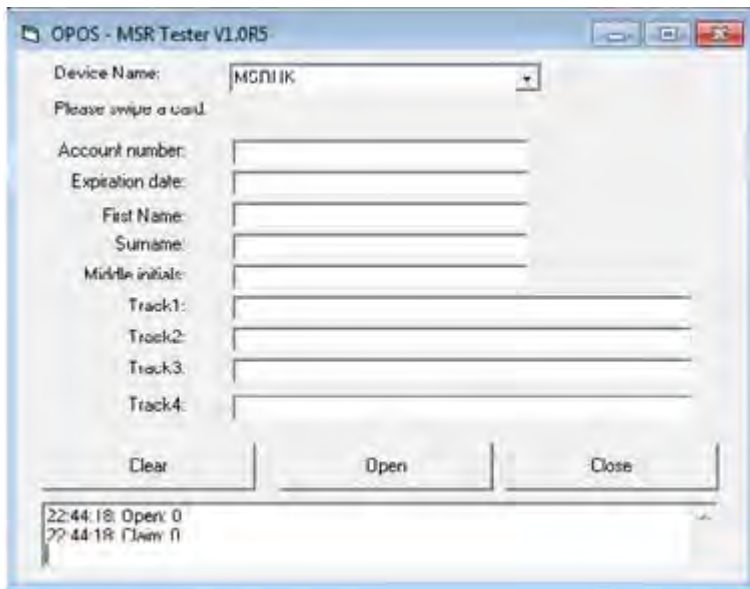
e.) Example 3. PROMAG MSR PART-NO, HID mode
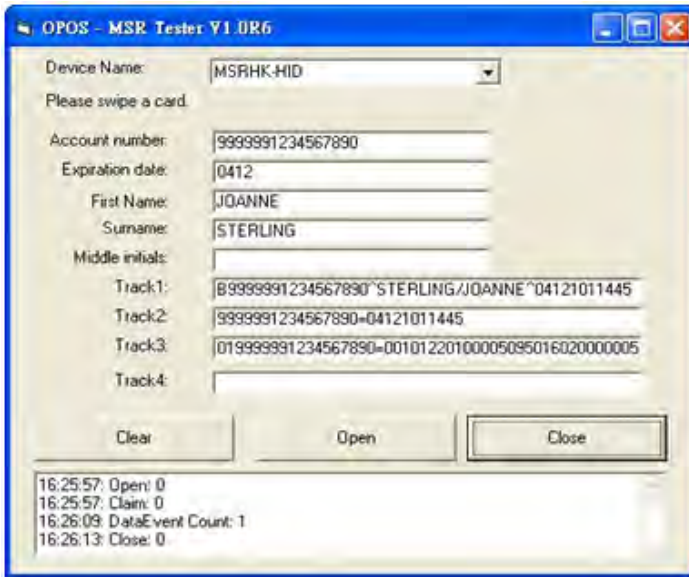
3.3   API

3.3.1   API Package Content

You can find the enclosed API Package files in the Protech Manual /Driver CD.
Depending on the machine types, the API Package may include the following files:

Function DLL			
Directory	**Function**	**File Name**	**Description**
ProxAPI standard	Cash Drawer	Cash Drawer.dll	Driver to control Cash Drawer
	WDT	Watchdog.dll	Driver to control Watchdog
	Hardware Monitor	Hardware Monitor.dll	Driver to read hardware data
	multilangXML.dll		Driver to open XML file
	Initial.xml		XML file to initiate the API Package
	ProxAP.exe		API program executable file
	XML Files\Model Name*\Initial.xml		XML file for each model
	Version.ini		Version Information

Sample Program		
Directory	**Contents / File Name**	**Description**
DEMO PROJECT	DEMO PROJECT\GPIO Sample Code	C# VB6 VB.net Source Code
	DEMO PROJECT\Digital Sample Code	C# VB6 VB.net Source Code
	DEMO PROJECT\Watchdog Sample Code	C# VB6 VB.net MFC Source Code

3.3.2   API Procedure

Take **VB2005 .NET** for example. Follow the instructions below to perform the API procedure:

Step 1. Declare a function. You may create a module in your project and fill in the function.
Example: Cash drawer

Declare Function GetCashDrawerStatus Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean

Declare Function CashDrawerOpen Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean

Step 2. Create a button to call API Function.

a.) Call Cash drawer open event:

Private Sub cash_btn1_Click (ByVal Sender As System.Object, ByVal e As System.EventArgs) Handles cash_btn1.Click
CashDrawerOpen(1), "1" specifies the cash drawer 1 port
CashDrawerOpen(2), "2" specifies the cash drawer 2 port
Timer1.start

b.) Detect Cash drawer status:
A timer event can be created.
Private Sub Timer1_Tick (ByVal Sender As System.Object,ByVal e As System.EventArgs) Handles Timer1.Tick
    Dim Receive_Status1 as Boolean
    Dim Receive_Status2 as Boolean
    Receive_Status1 = CashDrawerOpen(&H1)
    If Receive_Status1 = true then
       Text1.text = "cash drawer1 open"   'enter text into textbox.
Else
Text1.text = "cash drawer1 close"   'enter text into textbox.
End if
    '==
    Receive_Status2 = CashDrawerOpen(&H2)
    If Receive_Status2 = true then
       Text2.text = "cash drawer2 open"   'enter text into textbox.
Else
Text2.text = "cash drawer2 close"   'enter text into textbox.
End if
    '==

End sub

Sample Code

(1) VB Declaration Method
Declare Function GetCashDrawerStatus Lib CashDrawer.dll (ByVal
num_drawer as short) As Boolean

Declare Function CashDrawerOpen Lib CashDrawer.dll (ByVal num_drawer as
short) As Boolean

(2) Call Function
Open cash drawer:
CashDrawerOpen(1)
Open cash drawer1
CashDrawerOpen(2)
Open cash drawer2

Check cash drawer status:
Dim receive_status as Boolean
Check cash drawer1 status
Receive_Status = CashDrawerOpen(&H1)
Check cash drawer2 status
Receive_Status = CashDrawerOpen(&H2)

(1) C# Declaration Method
Public class PortAccess
{
[DllImport("CashDrawer.dll",EntryPoint = "Initial_CashDrawer")]
Public static extern void Initial_CashDrawer();
[DllImport("CashDrawer.dll",EntryPoint= "GetCashDrawerStatus")]
Public static extern bool GetCashDrawerStatus()
[DllImport("CashDrawer.dll",EntryPoint = "CashDrawerOpen")]
Public static extern bool CashDrawerOpen(short num_drawer);}

(2) Call Function
Open cash drawer1
PortAccess.CashDrawerOpen(0x01);   //check cash drawer1 status
Open cash drawer2
PortAccess.CashDrawerOpen(0x02);   //check cash drawer2 status

Bool bstatus;
bstatus = PortAccess.GetCashDrawerStatus(0x01);

bstatus = PortAccess.GetCashDrawerStatus(0x02); //Before get cash drawer status, need to initial cash drawer first

VB.NET external function:

Declare Function SetMinSec Lib "WatchDog.dll" (ByVal kind As Short,ByVal delay_time As Short) As Boolean
Declare Function Stopwatchdog Lib "WatchDog.dll" ( ) As Short
Declare Function Setwatchdog Lib "WatchDog.dll" (ByVal value As Short) As Boolean

Declare Function Digital_Initial Lib "Digital.dll" ( ) As Long
Declare Function Digtial_Set Lib "Digital.dll"(ByVal hex_value As Short) As Long
Declare Function Digtial_Get Lib "Digital.dll" ( ) As Short

Declare Function GPIO_Initial Lib "GPIO.dll" ( ) As Long
Declare Function GPIO_SetPort Lib "GPIO.dll"(ByVal direct As long)
Declare Function GPIO_Set Lib "GPIO.dll"(ByVal dout_value As long) As Boolean
Declare Function GPIO_Get Lib "GPIO.dll"( ) As Short

Declare Function GetCashDrawerStatus Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean
Declare Function CashDrawerOpen Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean

VB 6 external function:

Declare Function CashDrawerOpen Lib "CashDrawer.dll" (ByVal num_drawer As Integer) As Boolean
Declare Function GetCashDrawerStatus Lib "CashDrawer.dll" (ByVal num_drawer As Integer) As Boolean

Note: VB.net short = integer VB6

3.3.3 Cash Drawer

Button/Item	Description
OPEN (button)	Tap to open the cash drawer.
Cash Drawer Status	Cash drawer status will be displayed after **OPEN** is tapped. • Cash Drawer is closed when the following picture is shown: Cash Drawer Status: **Close** • Cash Drawer is opened when the following picture is shown: Cash Drawer Status: **Open**

3.3.4 Watchdog

Button/Item	Description
Count Mode (radio button)	Select second or minute as the time unit of the watchdog timer.
Setting Time	Set the timeout for the watchdog timer. (Maximum value: 255 seconds or minutes)
Watch Dog Control	• **Timeout Value**: Simulation timer of the API program. The running watchdog timeout will be displayed (in seconds). It is not as accurate as a hardware watchdog clock. • **START**: Tap to start the watchdog timer. Meanwhile, the **REFRESH** and **STOP** buttons will be enabled. • **STOP**: Tap to stop the watchdog timer. • **REFRESH**: Tap to restart the watchdog timer.

3.4   API Function

The API program-related sample programs, developed in VB.Net and C#, are provided for easy use of the API Package. Refer to the main API functions listed as below:

API Function		DLL	
Cash Drawer	CashDrawerOpen GetCashDrawerStatus	multilangXML.dll	CashDrawer.dll
Watchdog (WD)	Watchodog_Set Watchdog_Stop Watchdog_SetMinSec Watchdog_Recount		WatchDog.dll
Hardware Monitor	HMWVoltage_Get HMWTemperataure_Get HMWFanSpeed_Get		Hardware Monitor.dll

3.4.1   Cash Drawer Function

CashDrawerOpen

bool   CashDrawerOpen (short   num_drawer);

Purpose:	Open the cash drawer API.
Value:	num_drawer = 1 (Open the Cash Drawer1)
	num_drawer = 2 (Open the Cash Drawer2)
Return:	True (1) on success, False (0) on failure
Example:	CashDrawerOpen(0x01); // Open the Cash Drawer1

GetCashDrawerStatus

bool   GetCashDrawerStatus (short   num_drawer);

Purpose:	Get the cash drawer status.
Value:	num_drawer = 1 (Get the Cash Drawer1 status)
	num_drawer = 2 (Get the Cash Drawer2 status)
Return:	True (1) on success, False (0) on failure
Example:	Short data;

data= GetCashDrawerStatus(0x01);   // Get the Cash Drawer1 status
if (data)
MsgBox("open1");   // Cash Drawer1 status
"Open"
Else
MsgBox("close1");   // Cash Drawer1 status
"Close"
Endif

3.4.2   Watch Dog Function

Watchdog_Set

bool   Watchdog_Set (int   value);

Purpose: Set the timeout for the watchdog timer.
Value   value = 0 ~ 255
Return: True (1) on success, False (0) on failure

Watchdog_SetMinSec

bool   Watchdog_SetMinSec (int   kind);

Purpose: Set the unit of time as second/minute
Value   kind = 1 (Measured in unit of second)
                 2 (Measured in unit of minute)
Return: True (1) on success, False (0) on failure

Watchdog_Stop

bool   Watchdog_Stop (void);

Purpose: Stop the watchdog timer
Value   None
Return: True (1) on success, False (0) on failure

Watchdog_Recount

bool   Watchdog_Recount (void);

Purpose: Restart the watchdog timer
Value   None
Return: True (1) on success, False (0) on failure

3.5   BIOS Operation

3.5.1   BIOS Setup
The board **PA-6322** uses an AMI Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the BIOS Setup program, Power-on Self-Test (POST), the PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) Specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between an operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These elements provide standard environment for booting an operating system and running pre-boot applications. The following diagram shows the Extensible Firmware Interface's location in the software stack.
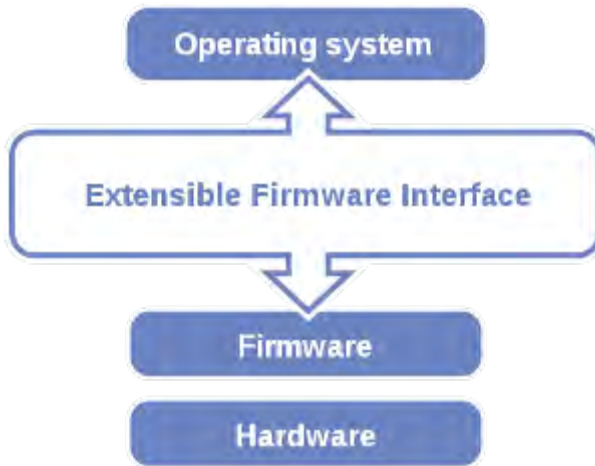
Figure 3-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change the system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <Del> or <ESC> key after the POST memory test begins and before the operating system boot begins. The settings are shown below.

3.5.1.1   Accessing Setup Utility

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines and the following message will appear on the lower screen:

Figure 3-2. POST Screen with AMI Logo

As long as this message is present on the screen you may press the <Del> key (the one that shares the decimal point at the bottom of the number keypad) to access the Setup program. In a moment, the main menu of the Aptio Setup Utility will appear on the screen:

```
                    Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                              Choose the system default
    BIOS Vendor                   American Megatrends             language
    Core Version                  5.010
    Compliancy                    UEFI 2.4; PI 1.3
    Project Version               67220TD2 x64
    Build Date and Time           04/13/2015 10:36:50

    TXE Information
    Sec RC Version                00.05.00.00
    TXE FW Version                01.00.02.1067

    System Language               [English]

    System Date                   [Sat 04/11/2015]               ↔: Select Screen
    System Time                   [23:36:12]                     ↑↓: Select Item
                                                                 Enter: Select
    Access Level                  Administrator                  +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit




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```

Figure 3-3. BIOS Setup Menu Initialization Screen

You may move the cursor by up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the bottom of the screen.

3.5.1.2 Main

Menu Path   *Main*

Figure 3-4. BIOS Main Menu

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of the current BIOS version.
Sec RC Version	No changeable options	Displays the current Sec RC version.
TXE FW Version	No changeable options	Displays the current TXE Version

BIOS Setting	Options	Description/Purpose
System Language	English	BIOS Setup language.
System Date	month, day, year	Set the current date. The "Day" is automatically changed.
System Time	hour, minute, second	Set the clock of the system.

3.5.1.3   Advanced

Menu Path   *Advanced*
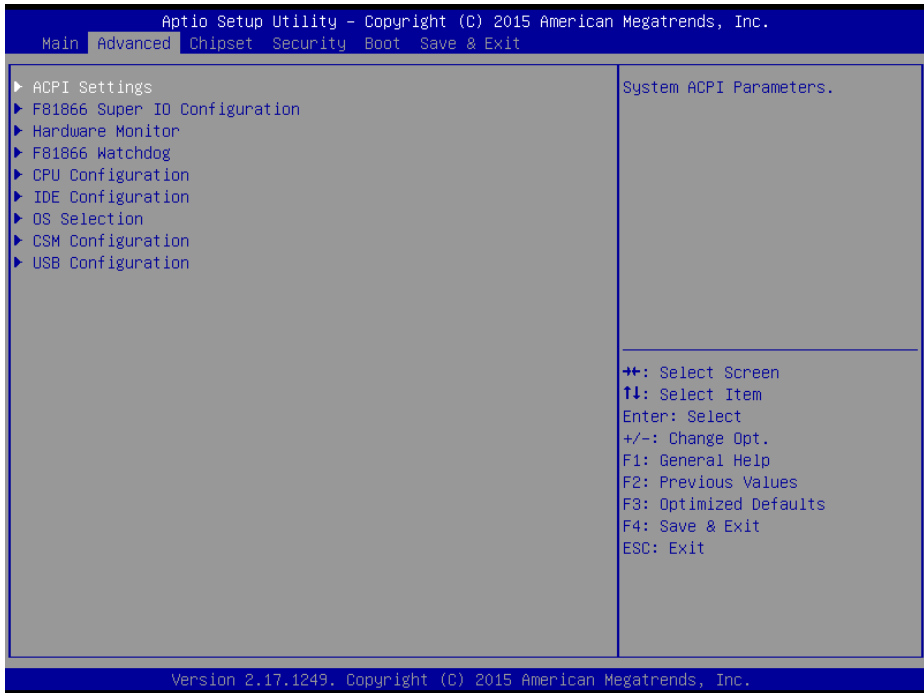
Figure 3-5. BIOS Advanced Menu

BIOS Setting	Options	Description/Purpose
ACPI Settings	Sub-Menu	System ACPI Parameters.

BIOS Setting	Options	Description/Purpose
F81866 Super IO Configuration	Sub-Menu	System Super IO Chip parameters.
Hardware Monitor	Sub-Menu	Monitor hardware status
F81866 Watchdog	Sub-Menu	F81866 Watchdog parameters
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
IDE Configuration	Sub-Menu	SATA Configuration Parameters.
OS Selection	Sub-Menu	OS Selection
CSM Configuration	Sub-Menu	Configure Option ROM execution, boot options filters, etc.
USB Configuration	Sub-Menu	USB Configuration Parameters.

ACPI Settings

Menu Path   *Advanced > ACPI Settings*
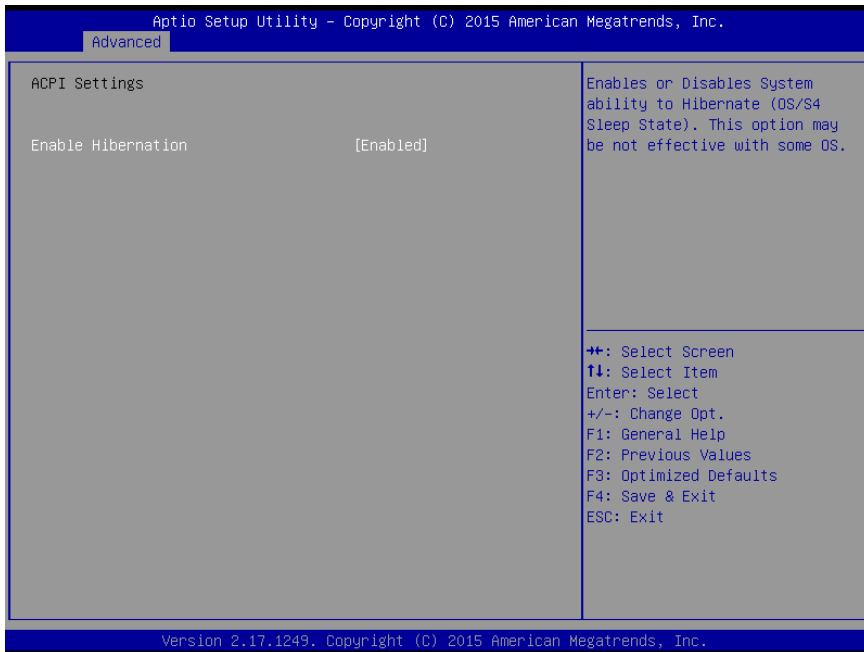
Figure 3-6. ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable Hibernation	- Disabled - Enabled	Enables or disables the system's ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OSes.

F81866 Super IO Configuration

Menu Path   *Advanced > F81866 Super IO Configuration*
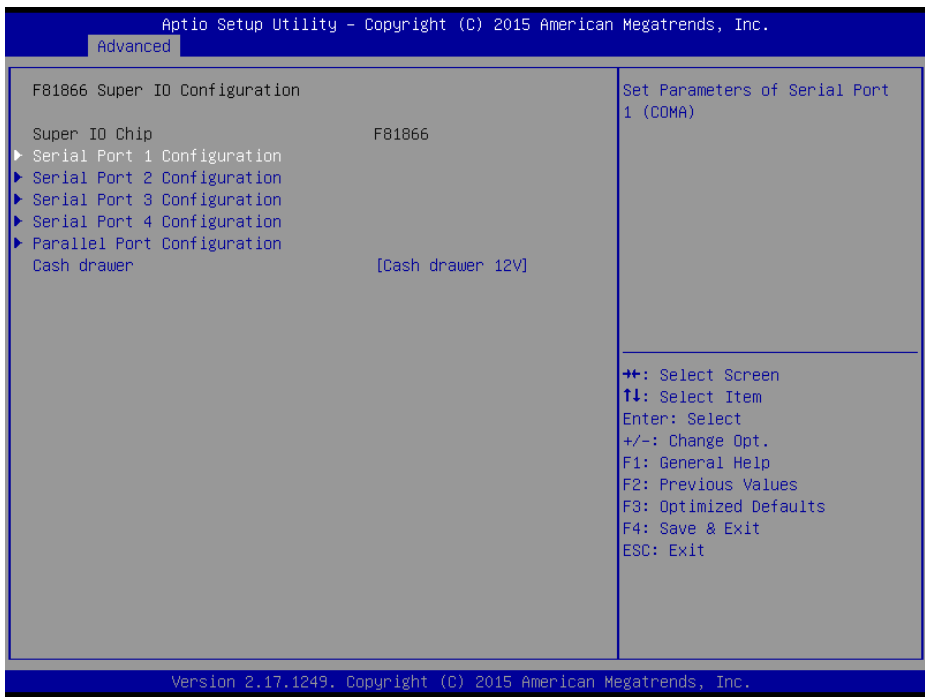
Figure 3-7. F81866 Super IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-menu	Configure the parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Sub-menu	Configure the parameters of Serial Port 2 (COMB).

BIOS Setting	Options	Description/Purpose
Serial Port 3 Configuration	Sub-menu	Configure the parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Sub-menu	Configure the parameters of Serial Port 4 (COMD).
Parallel Port Configuration	Sub-menu	Configure the parameters of Parallel Port (LPT/LPTE).
Cash Drawer	-Cash Drawer 12V -Cash Drawer 24V	Cash Drawer 12V or 24V selection

Serial Port 1 Configuration

Menu Path   *Advanced > F81866 Super IO Configuration > Serial Port 1 Configuration*
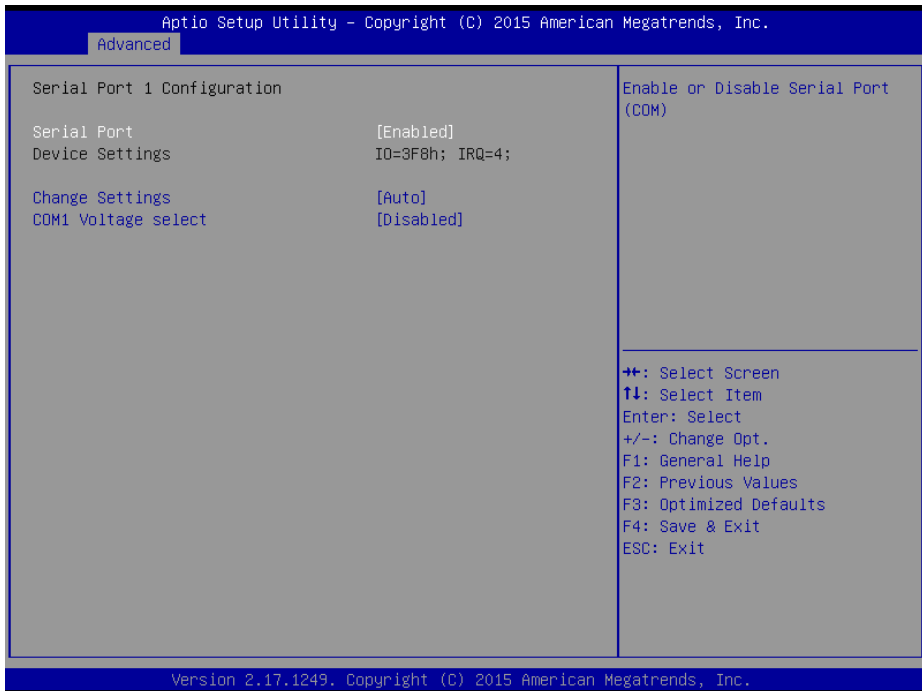
Figure 3-8. Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 1.
Device Settings	No changeable options	Display the current settings of Serial Port 1.
Change Settings	-Auto -IO=3F8h; IRQ=4; -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select IRQ and I/O resource settings for Serial Port 1.
COM1 Voltage Select	-Disabled -12V -5V	Disable or select 12V/5V voltage for COM1.

Serial Port 2 Configuration

Menu Path   *Advanced > F81866 Super IO Configuration > Serial Port 2 Configuration*
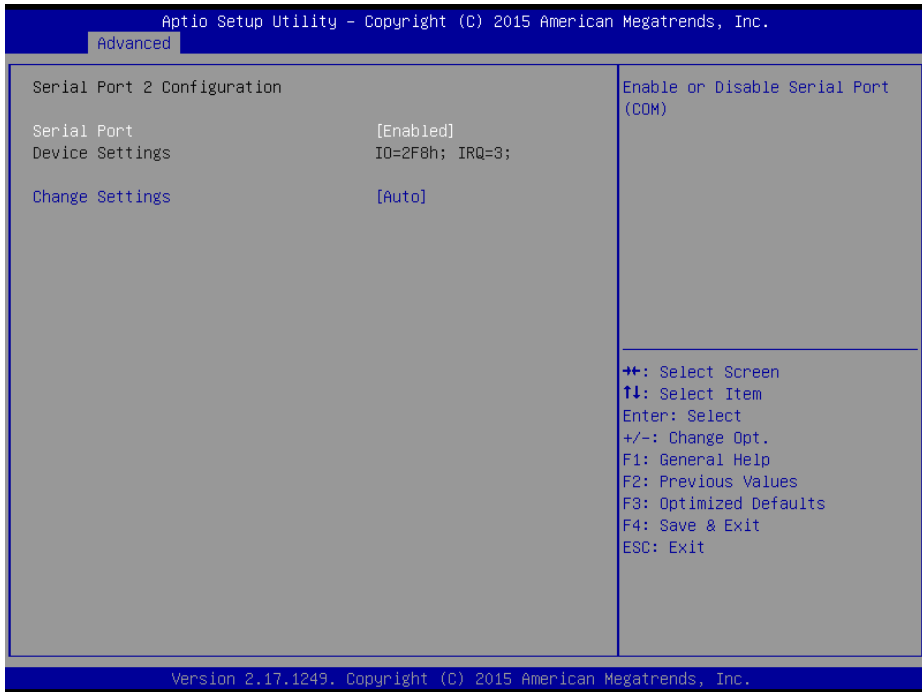
Figure 3-9. Serial Port 2 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 2.
Device Settings	No changeable options	Display the current settings of Serial Port 2.
Change settings	-Auto -IO=2F8h; IRQ=3; -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select IRQ and I/O resource for the serial port 2.

Serial Port 3 Configuration

Menu Path   *Advanced > F81866 Super IO Configuration > Serial Port 3 Configuration*
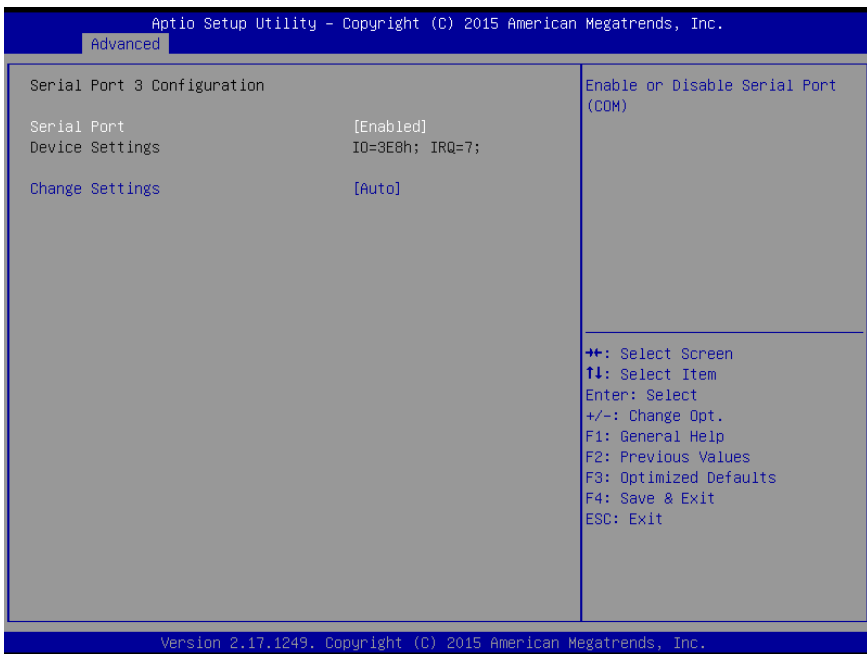
Figure 3-10. Serial Port 3 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 3.
Device Settings	No changeable options	Display the current settings of Serial Port 3.
Change settings	-Auto -IO=3E8h; IRQ=7; -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	Select IRQ and I/O resource for the serial port 3.

Serial Port 4 Configuration

Menu Path   *Advanced > F81866 Super IO Configuration > Serial Port 4 Configuration*
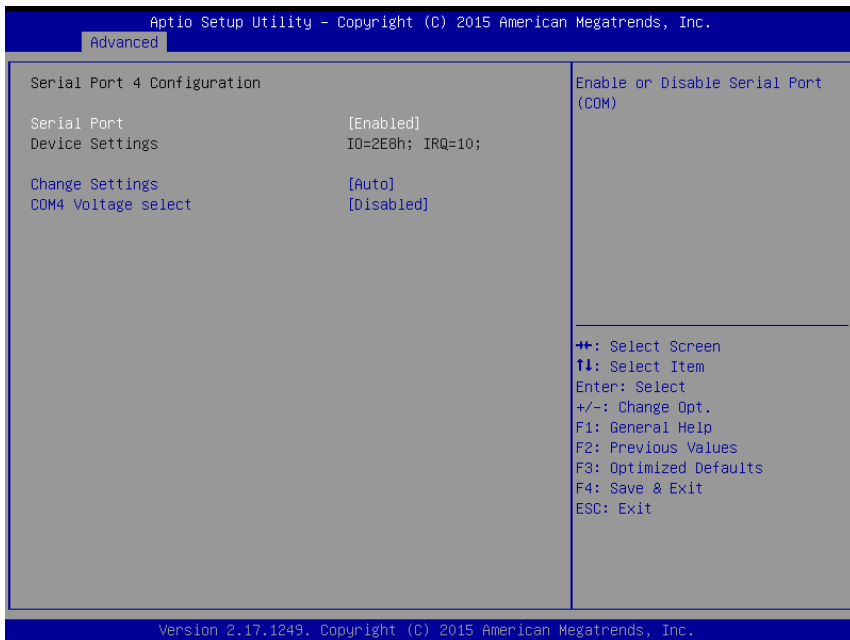
Figure 3-11. Serial Port 4 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 4.
Device Settings	No changeable options	Display the current settings of Serial Port 4.
Change settings	-Auto -IO=2E8h; IRQ=10; -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12; -IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	Select IRQ and I/O resource for the serial port 4.
COM4 Voltage select	-Disabled -12V -5V	Disable or select Voltage 12V/5V for COM4.

Parallel Port Configuration

Menu Path   *Advanced > F81866 Super IO Configuration > Parallel Port*
              Configuration

```
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     Advanced

   Parallel Port Configuration                             Enable or Disable Parallel
                                                           Port (LPT/LPTE)
   Parallel Port                    [Enabled]
   Device Settings                  IO=378h; IRQ=5;

   Change Settings                  [Auto]
   Device Mode                      [STD Printer Mode]




                                                           ++: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit




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```

Figure 3-12. Parallel Port Configuration Screen

BIOS Setting	Options	Description/Purpose
Parallel Port	-Disabled -Enabled	Enable or disable Parallel Port.
Device Settings	No changeable options	Displays current settings of Parallel Port.
Change settings	-Auto -IO=378h; IRQ=5 -IO=378h; IRQ=5,6,7,9,10,11,12 -IO=278h; IRQ=5,6,7,9,10,11,12 -IO=3BCh; IRQ=5,6,7,9,10,11,12	Select IRQ and I/O resource for the parallel port.
Device Mode	-STD Printer Mode	Change the printer port mode.

BIOS Setting	Options	Description/Purpose
	-SPP Mode -EPP-1.9 and SPP Mode -EPP-1.7 and SPP Mode -ECP Mode -ECP and EPP 1.9 Mode -ECP and EPP 1.7 Mode	

Hardware Monitor

Menu Path　　*Advanced > Hardware Monitor*
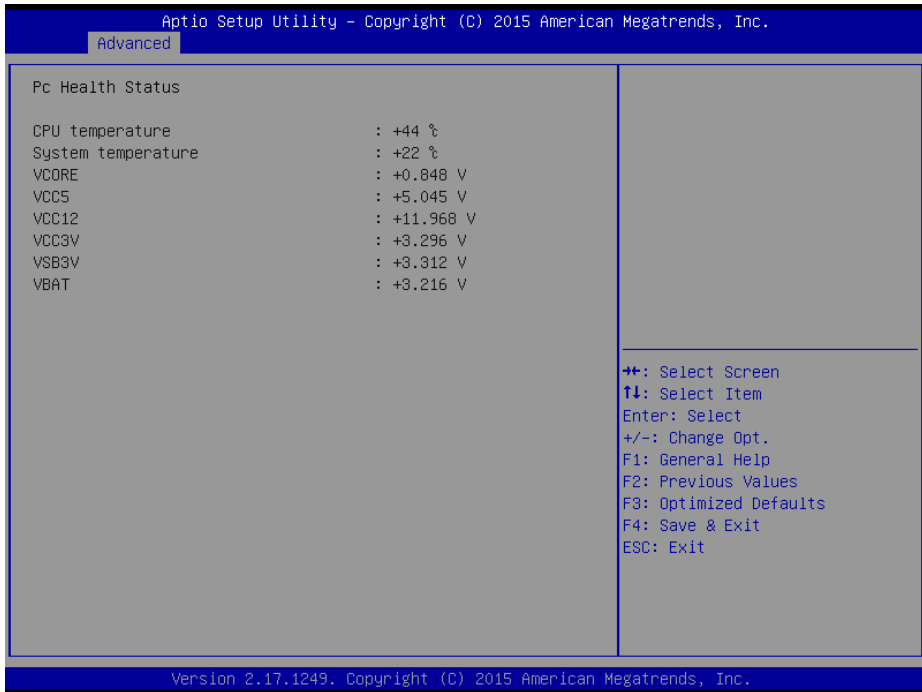
Figure 3-13. Hardware Monitor Screen

BIOS Setting	Options	Description/Purpose
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system's temperature.
VCORE	No changeable options	Displays the voltage level of VCORE in supply.
VCC5	No changeable options	Displays the voltage level of VCC5 in supply.
VCC12	No changeable options	Displays the voltage level of VCC12 in supply.
VCC3V	No changeable options	Displays the voltage level of VCC3V in supply.
VSB3V	No changeable options	Displays the voltage level of VSB3V in supply.
VBAT	No changeable options	Displays the voltage level of VBAT in supply.

F81866 Watchdog

Menu Path   *Advanced > F81866 Watchdog*

```
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     Advanced

     F81866 Watchdog                                         F81866 Watchdog timer settings
                                                             Enable/Disable
     Enable Watchdog                 [Disabled]




                                                             ++: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



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```
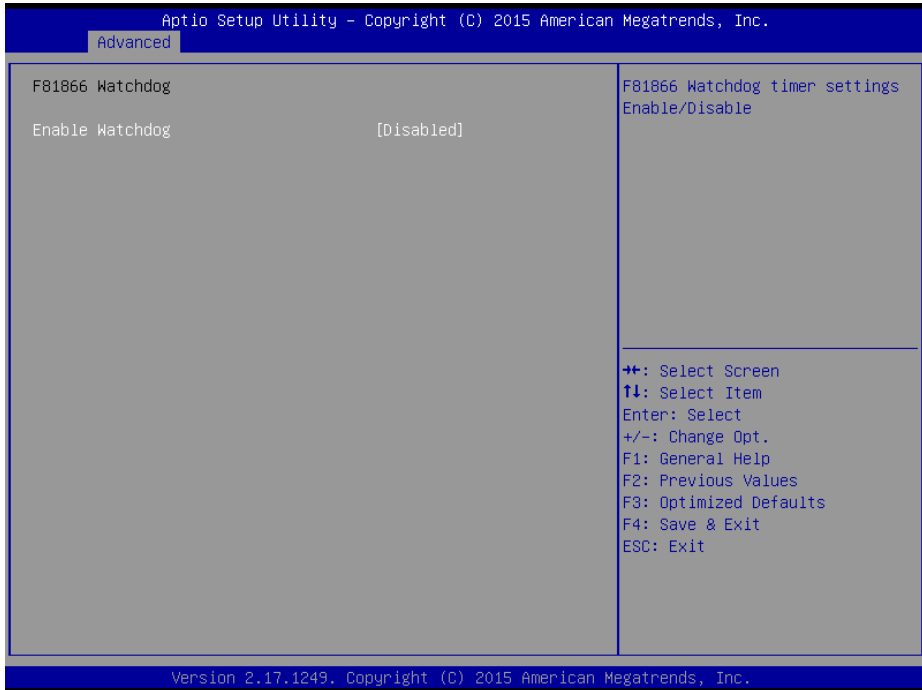
Figure 3-14. F81866 Watchdog Screen

BIOS Setting	Options	Description/Purpose
Enable WatchDog	-Enabled -Disable	Enable/ Disable Watch dog timer.
Watchdog timer unit	-1s -60s	Select seconds or minutes
Count for Timer (Seconds)	multiple options ranging from 1 to 255	Sets the desired value (in seconds) for watchdog timer.

CPU Configuration

Menu Path   *Advanced > CPU Configuration*

Figure 3-15. CPU Configuration Screen

BIOS Setting	Options	Description/Purpose
Socket 0 CPU Information	Sub-Menu	Report CPU Information
CPU Speed	No changeable options	Reports the current CPU Speed
64-bit	No changeable options	Reports if the processor supports Intel x86-64 (amd64) implementation.

Socket 0 CPU Configuration

Menu Path   *Advanced > CPU Configuration > Socket 0 CPU Information*

```
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         Advanced

       Socket 0 CPU Information

       Intel(R) Celeron(R) CPU J1900 @ 1.99GHz
       CPU Signature                    30678
       Microcode Patch                  82d
       Max CPU Speed                    1990 MHz
       Min CPU Speed                    1334 MHz
       Processor Cores                  4
       Intel HT Technology              Not Supported
       Intel VT-x Technology            Supported

       L1 Data Cache                    24 kB x 4
       L1 Code Cache                    32 kB x 4
       L2 Cache                         1024 kB x 2      →←: Select Screen
       L3 Cache                         Not Present      ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit



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```

Figure 3-16. Socket 0 CPU Information Screen

BIOS Setting	Options	Description/Purpose
CPU Signature	No changeable options	Reports the CPU Signature.
Microcode Patch	No changeable options	Reports the CPU Microcode Patch Version.
Max CPU Speed	No changeable options	Reports the maximum CPU Speed.
Min CPU Speed	No changeable options	Reports the minimum CPU Speed.
Processor Cores	No changeable options	Displays the number of physical cores in the processor.
Intel HT Technology	No changeable options	Reports if Intel Hyper-Threading Technology is supported by the processor
Intel VT-x Technology	No changeable options	Reports if Intel VT-x Technology is supported by the processor.
L1 Data Cache	No changeable options	Displays the size of L1 Data Cache
L1 Code Cache	No changeable options	Displays the size of L1 Code Cache
L2 Cache	No changeable options	Displays the size of L2 Cache.
L3 Cache	No changeable options	Displays the size of L3 Cache.

IDE Configuration

Menu Path   *Advanced > IDE Configuration*

```
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      Advanced

    IDE Configuration                                    Enable / Disable Serial ATA

    Serial-ATA (SATA)                 [Enabled]
    SATA Test Mode                    [Disabled]

    SATA Speed Support                [Gen2]
    SATA ODD Port                     [No ODD]
    SATA Mode                         [AHCI Mode]

    Serial-ATA Port 0                 [Enabled]
    SATA Port0 HotPlug                [Disabled]

    Serial-ATA Port 1                 [Enabled]
    SATA Port1 HotPlug                [Disabled]        →←: Select Screen
                                                        ↑↓: Select Item
    SATA Port0                                          Enter: Select
    WDC WD800BEVS- (80.0GB)                             +/-: Change Opt.
                                                        F1: General Help
    SATA Port1                                          F2: Previous Values
    Not Present                                         F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Figure 3-17. IDE Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial-ATA Controller(s)	- Disabled - Enabled	Enable or disable SATA Device.
SATA Test Mode	- Disabled - Enabled	Enable or disable SATA Test Mode.
SATA Speed Support	- GEN1 - GEN2	• **Gen1** mode sets the device to 1.5 Gbit/s speed. • **Gen2** mode sets the device to 3 Gbit/s speed (in case it is compatible).
SATA ODD Port	- Port0 ODD - Port1 ODD - No ODD	SATA ODD is Port0 or Port1

BIOS Setting	Options	Description/Purpose
SATA Mode	- IDE mode - AHCI mode	Configures SATA as follows: • **IDE:** Set SATA operation mode to IDE mode. • **AHCI:** SATA works as AHCI (Advanced Host Controller Interface) mode for achieving better performance.
SATA Port 0	- Disabled - Enabled	Enable or disable SATA port 0 Device.
SATA Port 0 HotPlug	- Disabled - Enabled	Enable or disable SATA port 0 Device HotPlug
SATA Port 1	- Disabled - Enabled	Enable or disable SATA port 1 Device.
SATA Port 1 HotPlug	- Disabled - Enabled	Enable or disable SATA port 1 Device HotPlug.
SATA Port 0	[drive]	Displays the drive installed on this SATA port 0. Shows [Empty] if no drive is installed.
SATA Port 1	[drive]	Displays the drive installed on this SATA port 1. Shows [Empty] if no drive is installed.

OS Selection

Menu Path   *Advanced > OS Selection*
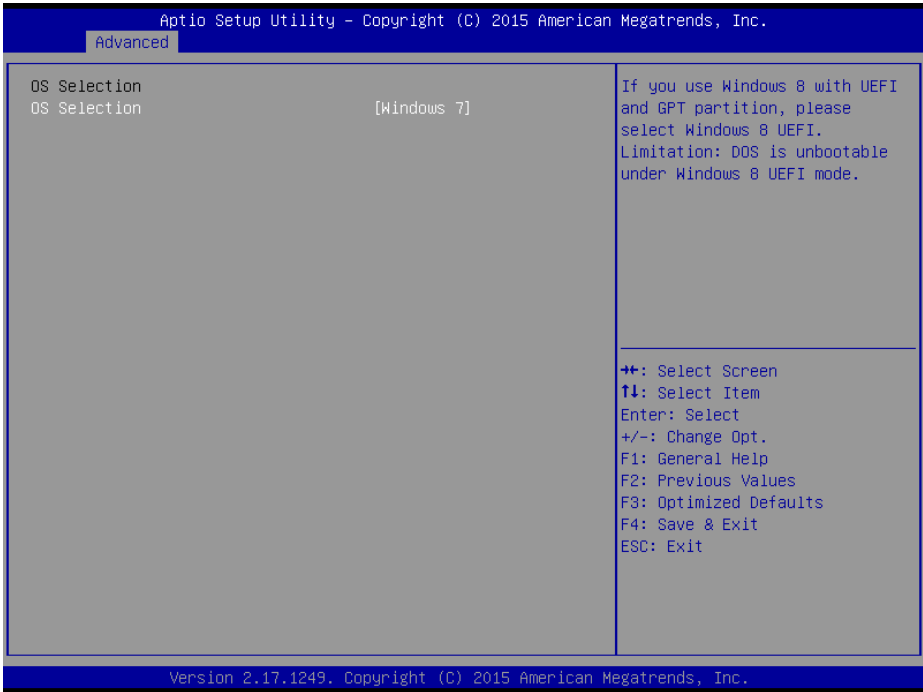
Figure 3-18. OS Selection Screen

BIOS Setting	Options	Description/Purpose
OS Selection	- Windows 7 - Windows 8 - Windows 8 UEFI	If you use Windows 8 with UEFI and GPT partition, please select Windows 8 UEFI. Limitation: DOS is unbootable under Windows 8 UEFI mode.

CSM Configuration

Menu Path   *Advanced > CSM Configuration*
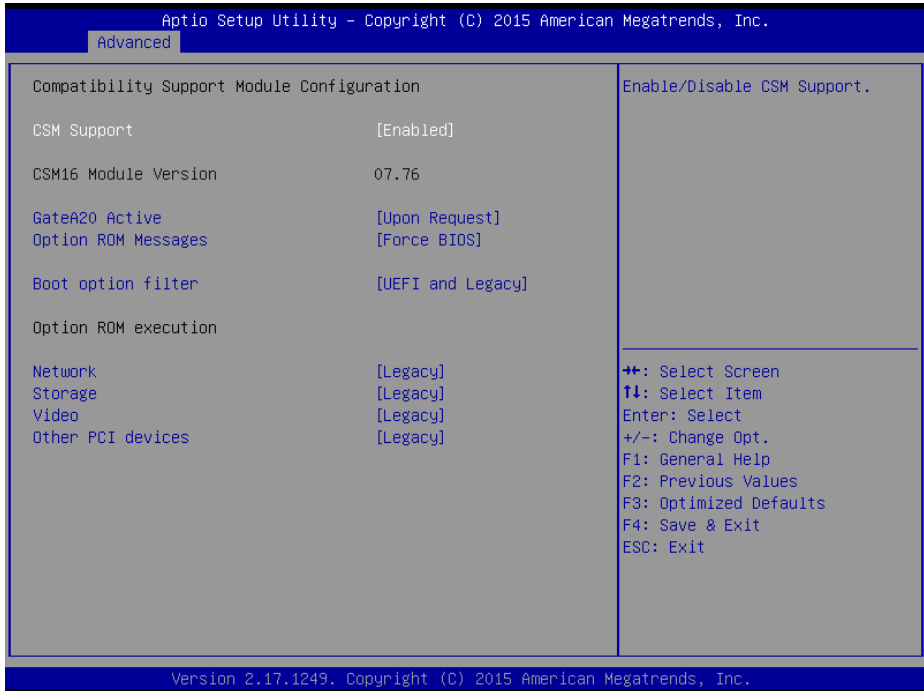
Figure 3-19. CSM Configuration Screen

BIOS Setting	Options	Description/Purpose
CSM Support	- Disabled - Enabled	Disable or enable CSM support.
CSM16 Module Version	No changeable options	Displays the current CSM (Compatibility Support Module) version.
GateA20 Active	- Upon Request - Always	Select Gate A20 operation mode. • **Upon Request:** GA20 can be disabled via BIOS services. • **Always:** Do not allow disabling GA20; this option is useful when any RT code is

BIOS Setting	Options	Description/Purpose
		executed above 1MB.
Option ROM Messages	- Force BIOS - Keep Current	Set the display mode for Option ROM messages.
Boot option filter	- UEFI and Legacy - Legacy only - UEFI only	This option controls what kind of devices the system can boot.
Network	- Do not launch - UEFI - Legacy	Controls the execution of UEFI or Legacy PXE.
Storage	- Do not launch - UEFI - Legacy	Controls the execution of UEFI or Legacy Storage.
Video	- Do not launch - UEFI - Legacy	Controls the execution of UEFI and Legacy Video.
Other PCI devices	- Do not launch - UEFI - Legacy	Select the launch method for other PCI devices, such as NIC, mass storage or video card.

USB Configuration

Menu Path   *Advanced > USB Configuration*

```
          Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
     Advanced

  USB Configuration                                   Enables Legacy USB support.
                                                      AUTO option disables legacy
  USB Module Version              10                  support if no USB devices are
                                                      connected. DISABLE option will
  USB Devices:                                        keep USB devices available
       1 Drive, 1 Keyboard, 1 Mouse, 3 Hubs           only for EFI applications.

  Legacy USB Support              [Enabled]
  XHCI Hand-off                   [Enabled]
  EHCI Hand-off                   [Disabled]
  USB Mass Storage Driver Support [Enabled]

  USB hardware delays and time-outs:
  USB transfer time-out           [20 sec]            →←: Select Screen
  Device reset time-out           [20 sec]            ↑↓: Select Item
  Device power-up delay           [Auto]              Enter: Select
                                                      +/-: Change Opt.
  Mass Storage Devices:                               F1: General Help
  SanDisk Cruzer Blade 1.20       [Auto]              F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


          Version 2.17.1249. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3-20. USB Configuration Screen

BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays number of available USB devices.
Legacy USB Support	- Disabled - Enabled - Auto	Enables support for legacy USB.
XHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without XHCI hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without EHCI hand-off support.
USB Mass	- Disabled	Enable/Disable USB mass storage driver

BIOS Setting	Options	Description/Purpose
Storage Driver Support	- Enabled	support.
USB transfer time-out	1 / 5 / 10 /20 sec	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 / 20 / 30 / 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	- Auto - Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
Device power-up delay in seconds	multiple options ranging from 1 to 40	The delay range is 1to 40 seconds in one second increments
Mass Storage Devices:	- Auto - Floppy - Force FDD - Hard Disk - CD-ROM	Displays the device name and choose the device emulation type.

3.5.1.4 Chipset

Menu Path   *Chipset*
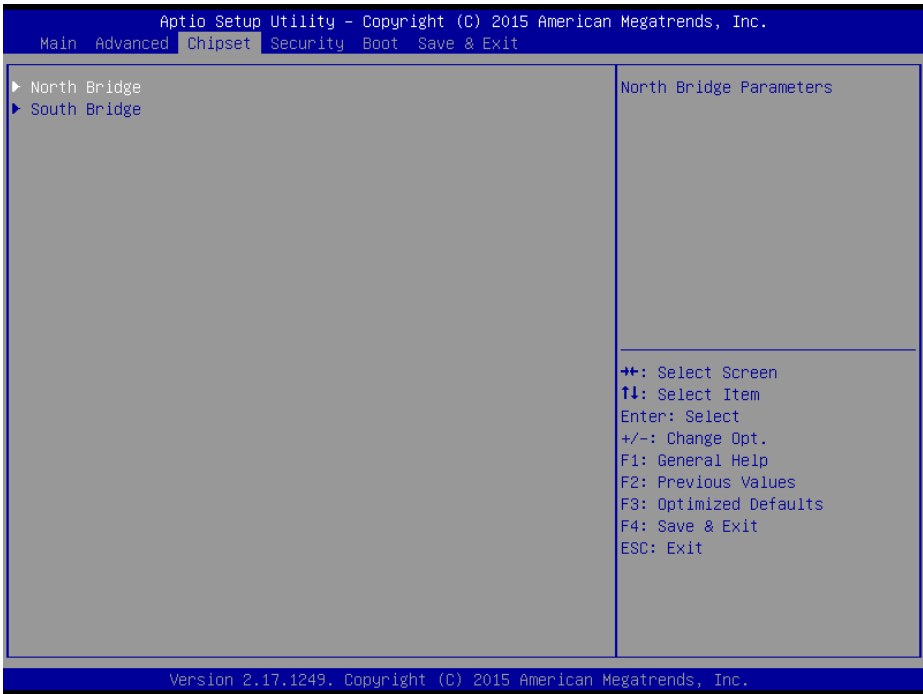
Figure 3-21. Chipset Menu Screen

BIOS Setting	Options	Description/Purpose
North Bridge	Sub-menu	Sets the Parameter for (North Bridge) configuration.
South Bridge	Sub-menu	Sets the Parameter for (South Bridge) configuration.

North Bridge

Menu Path   *Chipset > North Bridge*

```
              Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
                Chipset
 ▶ LCD Control                                              LCD Control

   Memory Information

   Total Memory                      4096 MB (DDR3L)

   Memory Slot0                      4096 MB (DDR3L)



                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



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```
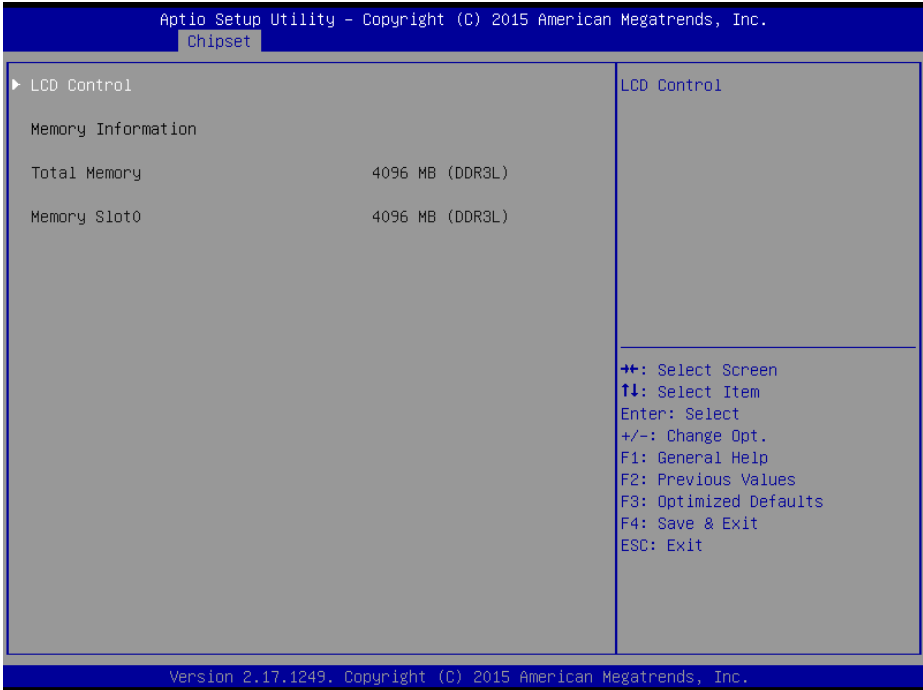
Figure 3-22. North Bridge Menu Screen

BIOS Setting	Options	Description/Purpose
LCD Control	Sub-menu	Allows users to execute the LCD Control.
Memory Information	No changeable options	Displays the DRAM information on the platform.
Total Memory	No changeable options	Displays the DRAM size.
Memory Slot0	No changeable options	Memory in the slot 0.

LCD Control

Menu Path   *Chipset > North Bridge > LCD Control*

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
           Chipset

  LCD Control                                           Select the Video Device which
                                                        will be activated during POST.
  Primary IGFX Boot Display         [LVDS]              This has no effect if external
  Secondary IGFX Boot Display       [CRT]               graphics present.
                                                        Secondary boot display
                                                        selection will appear based on
                                                        your selection.
                                                        VGA modes will be supported
                                                        only on primary display


                                                        ++: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Figure 3-23. LCD Control Screen

BIOS Setting	Options	Description/Purpose
Primary IGFX Boot Display	- CRT - LVDS	Selects the Primary Display Device.
Secondary IGFX Boot Display	- Disabled - CRT - LVDS	Selects the Secondary Display Device.

South Bridge

Menu Path   *Chipset > South Bridge*
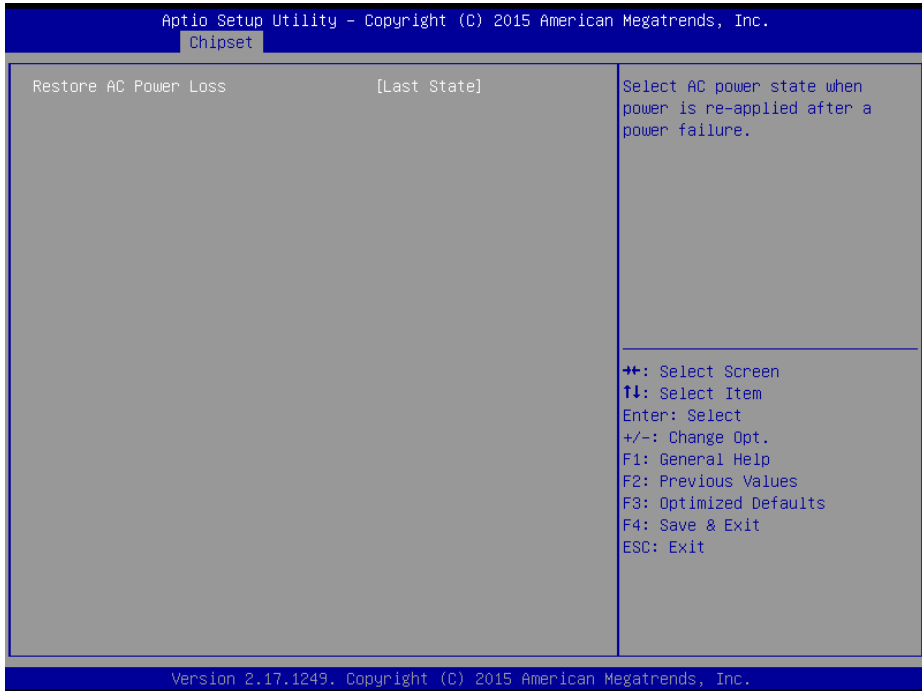
Figure 3-24. South Bridge Screen

BIOS Setting	Options	Description/Purpose
Restore AC Power Loss	- Power Off - Power On - Last State	Select the AC power state when power is re-applied following a power failure. • **Power Off** keeps the power off till the power button is pressed. • **Power On** keeps the system power on after the AC power is restored to the board. • **Last State** brings the system back to the last power state before AC power is lost.

3.5.1.5 Security

Menu Path   *Security*
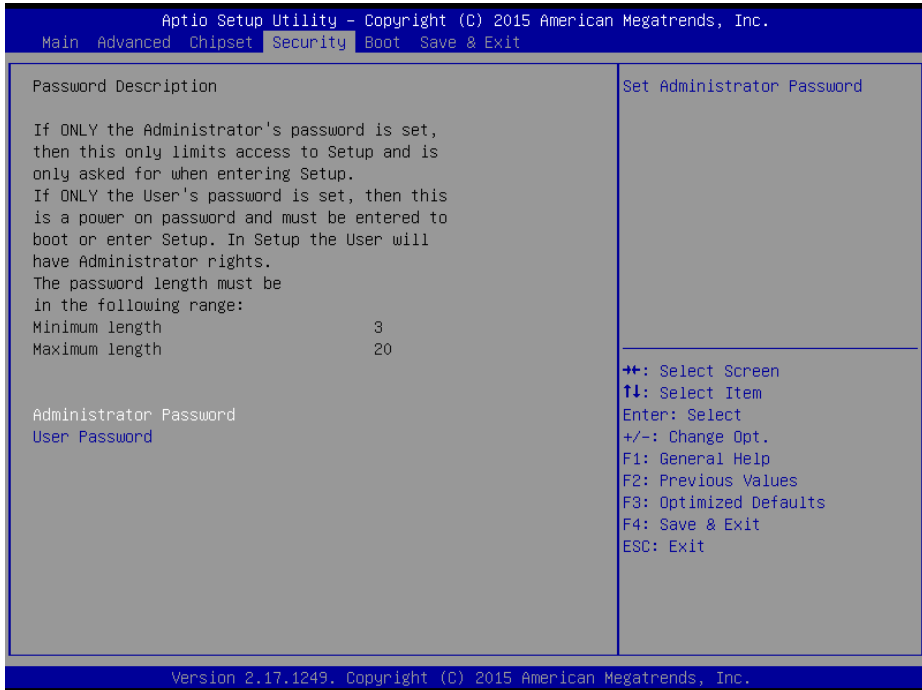
Figure 3-25. Security Menu Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies the user password.

3.5.1.6 Boot

Menu Path   *Boot*

```
                 Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

    Boot Configuration                                         Number of seconds to wait for
    Setup Prompt Timeout                     6                 setup activation key.
    Bootup NumLock State               [On]                    65535(0xFFFF) means indefinite
                                                               waiting.
    Quiet Boot                         [Disabled]
    Fast Boot                          [Disabled]


    Boot Option Priorities
    Boot Option #1                     [UEFI: Built-in EFI ...]
    Boot Option #2                     [P0: WDC WD800BEVS-2...]
    Boot Option #3                     [UEFI: SanDisk Cruze...]

    Hard Drive BBS Priorities                                  ↔: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit




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```

Figure 3-26. Boot Menu Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Selects the NumLock sate after the system is powered on. • **On:** Enable the NumLock function automatically after the system is powered on. • **Off:** Disable the NumLock function after the system is powered on.
Quiet Boot	- Disabled	Enables/Disables Quiet Boot Options.

BIOS Setting	Options	Description/Purpose
	- Enabled	
Fast Boot	- Disabled - Enabled	Enables/Disables Fast Boot Options
Boot Option #1~#n	- [Drive(s)] - Disabled	Allows users to choose the priority of the boot devices listed in Hard Drive BBS Priorities.
Hard Drive BBS Priorities	Sub-Menu	Allows users to specify the boot order of the available drive(s)

3.5.1.7   Save & Exit

Menu Path   *Save & Exit*

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

  Save Changes and Exit                              Exit system setup after saving
  Discard Changes and Exit                           the changes.
  Save Changes and Reset
  Discard Changes and Reset

  Save Options
  Save Changes
  Discard Changes

  Restore Defaults
  Save as User Defaults
  Restore User Defaults

  Boot Override                                      →←: Select Screen
  UEFI: Built-in EFI Shell                           ↑↓: Select Item
  P0: WDC WD800BEVS-26VAT0                            Enter: Select
  UEFI: SanDisk Cruzer Blade 1.20                    +/-: Change Opt.
                                                     F1: General Help
  Launch EFI Shell from filesystem device            F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



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```

Figure 3-27. Save & Exit Menu Screen

BIOS Setting	Options	Description/Purpose
Save Changes and Exit	No changeable options	Exits and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in NVRAM and resets.
Discard Changes and Reset	No changeable options	Resets without saving any changes made in BIOS settings.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

3.5.2 Configuring WatchDog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Configuration Sequence

To program F81866 configuration registers, the following configuration sequence must be followed:

(1) Enter the Extended Function Mode

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

(2) Configure the Configuration Registers

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

(3) Exit the Extended Function Mode

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Code Example for Watchdog Timer

Enable the watchdog timer and set the timeout interval to 30 seconds.

```
; ----------------------- Enter to extended function mode
mov             dx,                 2eh
mov             al,                 87h
out             dx,                 al
out             dx,                 al
; --------------------- Select Logical Device 7 of watchdog timer
mov             al,                 07h
out             dx,                 al
inc             dx
mov             al,                 07h
out             dx,                 al
;-----------------------------Enable Watch dog feature
mov             al,                 030h
out             dx,                 al
inc             dx
mov             al,                 01h
out             dx,                 al
;---------------------------- Enable Watch PME-------------------------
dec             dx
mov             al,                 0FAh
out             dx,                 al
inc             dx
in              al,                 dx
and             al,                 51h
out             dx,                 al
;------------------------ Set second as counting unit
dec             dx
mov             al,                 0f5h
out             dx,                 al
inc             dx
in              al,                 dx
and             al,                 30h
out             dx,                 al
; ----------- Set timeout interval as 30seconds and start counting ---
```

```
dec              dx
mov              al,              0f6h
out              dx,              al
inc              dx
mov              al,              1Eh
out              dx,              al
;-----------------------------Exit the extended function mode
dec              dx
mov              al,              0aah
out              dx,              al
```

3.5.3 Update Procedure

I. Prerequisites

1. Prepare a bootable media (e.g. USB storage device) which can boot the system to DOS prompt.

2. Download and save the BIOS file (e.g. 67220PD1.bin) to the bootable device.

3. Copy AMI flash utility – AFUDOS.exe (V5.07) into the bootable device

4. Make sure the target system can first boot to the bootable device.

   (1) Connect the bootable USB device.

   (2) Turn on the computer and press <Del> or <Esc> key during boot to enter BIOS setup menu.

   (3) The system will go into the BIOS setup menu.

   (4) Select [Boot] menu as the picture shown below.

   (5) Select [Hard Drive BBS Priorities] and set the USB bootable device as the 1st boot device.

   (6) Press <F4> key to save the configuration and exit the BIOS setup menu.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Boot

Boot Option #1   [JetFlashTranscend 4...]   Sets the system boot order
Boot Option #2   [P0: WDC WD1600BEVT-...]

                                                                 ➔←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
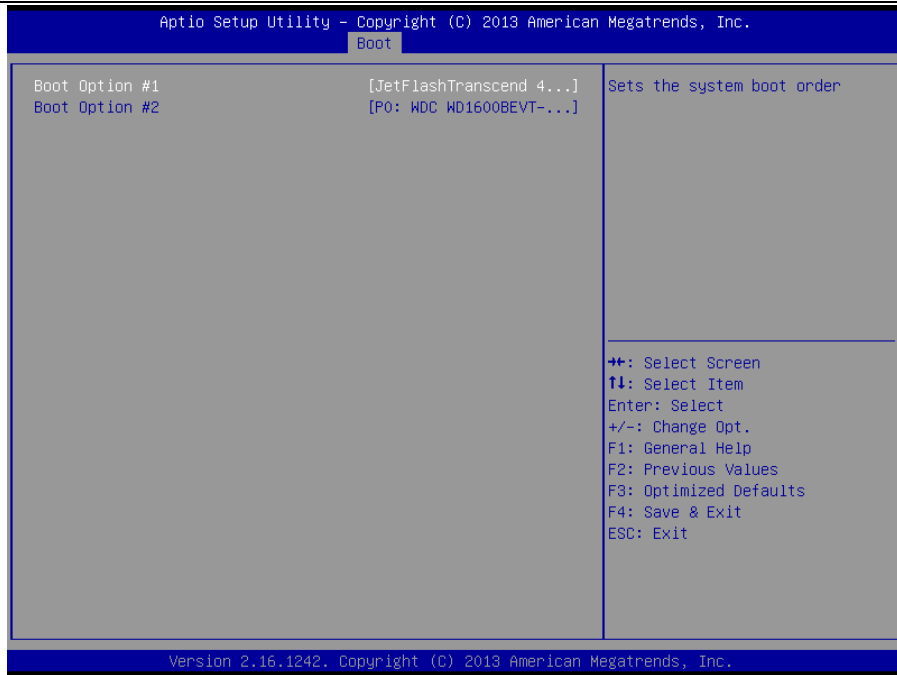
II. AFUDOS Command for System BIOS Update

AFUDOS.exe is aforementioned AMI firmware update utility; the command line is shown as below:

AFUDOS <ROM File Name> [option1] [option2]…

You can type AFUDOS /? to see the definitions of all the control options. The recommended options for BIOS ROM update include the following parameters:

/P: Program main BIOS image
/B: Program Boot Block
/N: Program NVRAM
/X: Don't check ROM ID

III. BIOS Update Procedure

1. Use the bootable USB device to boot up the system into the MS-DOS command prompt.
2. Type in AFUDOS 6722xxxx.bin /p /b /n /x and press Enter to start the flash procedure.
   Note: xxxx means the BIOS revision part, ex. 0PD2…

3. During the update procedure, you will see the BIOS update process status and its execution percentage. Beware! Do not turn off or reset your computer before the update is completed, or it may crash the BIOS ROM and the system will be unable to boot up next time.
4. After the BIOS update is completed, the messages from AFUDOS utility will be shown as below:

```
C:\AFUDOS>AFUDOS 67220TD2.bin /P /B /N /X
+------------------------------------------------------------------------+
¦                  AMI Fireware Update Utility  v5.07.01                 ¦
¦        Copyright (C)2014 American Megatrends Inc. All Rights Reserved. ¦
+------------------------------------------------------------------------+
 Reading flash ............... done
 - ME Data Size checking . ok
 - FFS checksums ........ ok
 Erasing Boot Block .......... done
 Updating Boot Block ......... done
 Verifying Boot Block ........ done
 Erasing Main Block .......... done
 Updating Main Block ......... done
 Verifying Main Block ........ done
 Erasing NVRAM Block ......... done
 Updating NVRAM Block ........ done
 Verifying NVRAM Block ....... done

C:\AFUDOS>
```

5. Restart the system and boot up with the new BIOS configurations.
6. The BIOS Update is completed after the system is restarted.
7. Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.


```
Version 2.17.1249. Copyright (C) 2015 American Megatrends, Inc.
BIOS Date: 04/13/2015 10:58:08 Ver: 67220TD2
```

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3.5.4   Resource Map

3.5.4.1   Interrupt Map

PB-6722RA, RB

IRQ	Assignment
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 7	Communications Port (COM3)
IRQ 8	High precision event timer
IRQ 10	Communications Port (COM4)
IRQ 10	Intel® Atom™/Celeron®/Pentium® Processor Platform Control Unit - SMBus Port - 0F12
IRQ 12	PS/2 Compatible Mouse
IRQ 16	Intel® Atom™/Celeron®/Pentium® Processor PCI Express - Root Port 1- 0F48
IRQ 17	Intel® Atom™/Celeron®/Pentium® Processor PCI Express - Root Port 2 - 0F4A
IRQ 18	Intel® Atom™/Celeron®/Pentium® Processor PCI Express - Root Port 3 - 0F4C
IRQ 19	Intel® Atom™/Celeron®/Pentium® Processor PCI Express - Root Port 4 - 0F4E
IRQ 19	Intel® Atom™/Celeron®/Pentium® Processor AHCI - 0F23
IRQ 22	High Definition Audio Controller
IRQ 81	Microsoft ACPI-Compliant System
IRQ 82	Microsoft ACPI-Compliant System
IRQ 83	Microsoft ACPI-Compliant System
IRQ 84	Microsoft ACPI-Compliant System
IRQ 85	Microsoft ACPI-Compliant System
IRQ 86	Microsoft ACPI-Compliant System
IRQ 87	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 88	Microsoft ACPI-Compliant System
IRQ 89	Microsoft ACPI-Compliant System
IRQ 90	Microsoft ACPI-Compliant System
IRQ 91	Microsoft ACPI-Compliant System
IRQ 92	Microsoft ACPI-Compliant System
IRQ 93	Microsoft ACPI-Compliant System
IRQ 94	Microsoft ACPI-Compliant System
IRQ 95	Microsoft ACPI-Compliant System
IRQ 96	Microsoft ACPI-Compliant System
IRQ 97	Microsoft ACPI-Compliant System
IRQ 98	Microsoft ACPI-Compliant System
IRQ 99	Microsoft ACPI-Compliant System
IRQ 100	Microsoft ACPI-Compliant System
IRQ 101	Microsoft ACPI-Compliant System
IRQ 102	Microsoft ACPI-Compliant System
IRQ 103	Microsoft ACPI-Compliant System
IRQ 104	Microsoft ACPI-Compliant System
IRQ 105	Microsoft ACPI-Compliant System
IRQ 106	Microsoft ACPI-Compliant System
IRQ 107	Microsoft ACPI-Compliant System
IRQ 108	Microsoft ACPI-Compliant System
IRQ 109	Microsoft ACPI-Compliant System
IRQ 110	Microsoft ACPI-Compliant System
IRQ 111	Microsoft ACPI-Compliant System
IRQ 112	Microsoft ACPI-Compliant System
IRQ 113	Microsoft ACPI-Compliant System
IRQ 114	Microsoft ACPI-Compliant System
IRQ 115	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 116	Microsoft ACPI-Compliant System
IRQ 117	Microsoft ACPI-Compliant System
IRQ 118	Microsoft ACPI-Compliant System
IRQ 119	Microsoft ACPI-Compliant System
IRQ 120	Microsoft ACPI-Compliant System
IRQ 121	Microsoft ACPI-Compliant System
IRQ 122	Microsoft ACPI-Compliant System
IRQ 123	Microsoft ACPI-Compliant System
IRQ 124	Microsoft ACPI-Compliant System
IRQ 125	Microsoft ACPI-Compliant System
IRQ 126	Microsoft ACPI-Compliant System
IRQ 127	Microsoft ACPI-Compliant System
IRQ 128	Microsoft ACPI-Compliant System
IRQ 129	Microsoft ACPI-Compliant System
IRQ 130	Microsoft ACPI-Compliant System
IRQ 131	Microsoft ACPI-Compliant System
IRQ 132	Microsoft ACPI-Compliant System
IRQ 133	Microsoft ACPI-Compliant System
IRQ 134	Microsoft ACPI-Compliant System
IRQ 135	Microsoft ACPI-Compliant System
IRQ 136	Microsoft ACPI-Compliant System
IRQ 137	Microsoft ACPI-Compliant System
IRQ 138	Microsoft ACPI-Compliant System
IRQ 139	Microsoft ACPI-Compliant System
IRQ 140	Microsoft ACPI-Compliant System
IRQ 141	Microsoft ACPI-Compliant System
IRQ 142	Microsoft ACPI-Compliant System
IRQ 143	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 144	Microsoft ACPI-Compliant System
IRQ 145	Microsoft ACPI-Compliant System
IRQ 146	Microsoft ACPI-Compliant System
IRQ 147	Microsoft ACPI-Compliant System
IRQ 148	Microsoft ACPI-Compliant System
IRQ 149	Microsoft ACPI-Compliant System
IRQ 150	Microsoft ACPI-Compliant System
IRQ 151	Microsoft ACPI-Compliant System
IRQ 152	Microsoft ACPI-Compliant System
IRQ 153	Microsoft ACPI-Compliant System
IRQ 154	Microsoft ACPI-Compliant System
IRQ 155	Microsoft ACPI-Compliant System
IRQ 156	Microsoft ACPI-Compliant System
IRQ 157	Microsoft ACPI-Compliant System
IRQ 158	Microsoft ACPI-Compliant System
IRQ 159	Microsoft ACPI-Compliant System
IRQ 160	Microsoft ACPI-Compliant System
IRQ 161	Microsoft ACPI-Compliant System
IRQ 162	Microsoft ACPI-Compliant System
IRQ 163	Microsoft ACPI-Compliant System
IRQ 164	Microsoft ACPI-Compliant System
IRQ 165	Microsoft ACPI-Compliant System
IRQ 166	Microsoft ACPI-Compliant System
IRQ 167	Microsoft ACPI-Compliant System
IRQ 168	Microsoft ACPI-Compliant System
IRQ 169	Microsoft ACPI-Compliant System
IRQ 170	Microsoft ACPI-Compliant System
IRQ 171	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 172	Microsoft ACPI-Compliant System
IRQ 173	Microsoft ACPI-Compliant System
IRQ 174	Microsoft ACPI-Compliant System
IRQ 175	Microsoft ACPI-Compliant System
IRQ 176	Microsoft ACPI-Compliant System
IRQ 177	Microsoft ACPI-Compliant System
IRQ 178	Microsoft ACPI-Compliant System
IRQ 179	Microsoft ACPI-Compliant System
IRQ 180	Microsoft ACPI-Compliant System
IRQ 181	Microsoft ACPI-Compliant System
IRQ 182	Microsoft ACPI-Compliant System
IRQ 183	Microsoft ACPI-Compliant System
IRQ 184	Microsoft ACPI-Compliant System
IRQ 185	Microsoft ACPI-Compliant System
IRQ 186	Microsoft ACPI-Compliant System
IRQ 187	Microsoft ACPI-Compliant System
IRQ 188	Microsoft ACPI-Compliant System
IRQ 189	Microsoft ACPI-Compliant System
IRQ 190	Microsoft ACPI-Compliant System
IRQ 4294967292	Realtek PCIe GBE Family Controller
IRQ 4294967293	Intel$^®$ USB 3.0 eXtensible Host Controller
IRQ 4294967294	Intel$^®$ Atom^{TM}/ Processor E3800 Series/Intel$^®$ Celeron$^®$ Processor N2920/J1900

Note: These resource information were gathered using Windows 7 (the IRQ could be assigned differently depending on OS)

3.5.4.2   I/O MAP

I/O MAP	ASSIGNMENT
0x00000000-0x0000006F	PCI bus
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000064-0x00000064	Standard PS/2 Keyboard
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000077	System CMOS/real time clock
0x00000070-0x00000077	Motherboard resources
0x00000078-0x00000CF7	PCI bus
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller

I/O MAP	ASSIGNMENT
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000378-0x0000037F	Printer Port (LPT1)
0x000003B0-0x000003BB	Intel® Atom™/ Processor E3800 Series/Intel® Celeron® Processor N2920/J1900
0x000003C0-0x000003DF	Intel® Atom™/ Processor E3800 Series/Intel® Celeron® Processor N2920/J1900
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x0000E000-0x0000EFFF	Intel® Atom™/Celeron®/Pentium® Processor PCI Express - Root Port 4 - 0F4E
0x0000E000-0x0000EFFF	Realtek PCIe GBE Family Controller
0x0000F000-0x0000F01F	Intel® Atom™/Celeron®/Pentium® Processor Platform Control Unit - SMBus Port - 0F12
0x0000F020-0x0000F03F	Intel® Atom™/Celeron®/Pentium® Processor AHCI - 0F23

I/O MAP	ASSIGNMENT
0x0000F040-0x0000F043	Intel$^®$ Atom^{TM}/Celeron$^®$/Pentium$^®$ Processor AHCI - 0F23
0x0000F050-0x0000F057	Intel$^®$ Atom^{TM}/Celeron$^®$/Pentium$^®$ Processor AHCI - 0F23
0x0000F060-0x0000F063	Intel$^®$ Atom^{TM}/Celeron$^®$/Pentium$^®$ Processor AHCI - 0F23
0x0000F070-0x0000F077	Intel$^®$ Atom^{TM}/Celeron$^®$/Pentium$^®$ Processor AHCI - 0F23
0x0000F080-0x0000F087	Intel$^®$ Atom^{TM}/Processor E3800 Series/Intel$^®$ Celeron$^®$ Processor N2920/J1900

3.5.4.3 DMA Channels Map

TIMER CHANNEL	ASSIGNMENT
Channel 3	Printer Port (LPT1)

3.5.4.4 Memory Map

MEMORY MAP	ASSIGNMENT
0xD0600000-0xD06FFFFF	Intel® Atom™ /Celeron®/Pentium® Processor PCI Express - Root Port 4 - 0F4E
0xD0600000-0xD06FFFFF	Realtek PCIe GBE Family Controller
0xFF000000-0xFFFFFFFF	Intel® 82802 Firmware Hub Device
0xE00000D0-0xE00000DB	Intel® Atom™/Celeron®/Pentium® Processor MBI Device - 33BD
0xD0716000-0xD07167FF	Intel® Atom™/Celeron®/Pentium® Processor AHCI - 0F23
0xD0000000-0xD03FFFFF	Intel® Atom™ Processor E3800 Series/Intel® Celeron® Processor N2920/J1900
0xC0000000-0xCFFFFFFF	Intel® Atom™ Processor E3800 Series/Intel® Celeron® Processor N2920/J1900
0xC0000000-0xCFFFFFFF	PCI bus
0xFED00000-0xFED003FF	High precision event timer
0xD0604000-0xD0604FFF	Realtek PCIe GBE Family Controller
0xD0700000-0xD070FFFF	Intel® USB 3.0 eXtensible Host Controller
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xD0710000-0xD0713FFF	High Definition Audio Controller
0xD0714000-0xD071401F	Intel® Atom™/Celeron®/Pentium® Processor Platform Control Unit - SMBus Port - 0F12
0xD0500000-0xD05FFFFF	Intel® Trusted Execution Engine Interface
0xD0400000-0xD04FFFFF	Intel® Trusted Execution Engine Interface

MEMORY MAP	ASSIGNMENT
0xA0000-0xBFFFF	Intel® Atom™ Processor E3800 Series/Intel® Celeron® Processor N2920/J1900
0xA0000-0xBFFFF	PCI bus
0xC0000-0xDFFFF	PCI bus
0xE0000-0xFFFFF	PCI bus

Appendix A   System Diagrams

This appendix includes the exploded diagrams and part numbers of the PA-6322 system components. The following topics are included:

- Easy Maintenance
  - Hard Drive
  - Memory
  - Main Board
- Exploded Diagrams for Panel PC
- Exploded Diagrams for Stand
- Exploded Diagrams for Printer Module
- Exploded Diagrams for Packing
- Exploded Diagrams for Spare Parts

Easy Maintenance_HDD

Panel PC

Step 2. Pull out HDD tray.
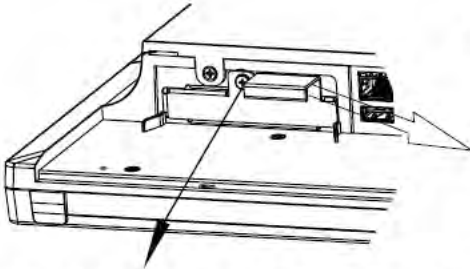
Step 1. Unassemble the HDD fixing screw.
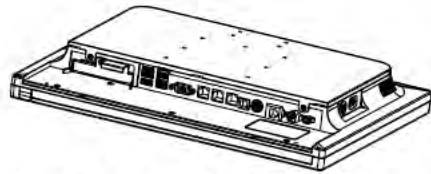
Easy Stand

Step 1. Lay down System on a flat surface as shown below:
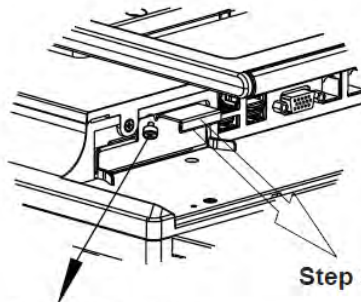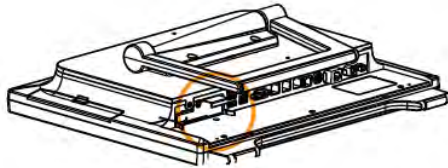
Step 3. Pull out HDD tray.

Step 2. Unassemble the HDD fixing screw.

Normal Stand

Step 1.
Adjust LCD angle to zero degree.
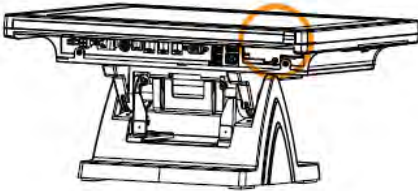
Step 3. Pull out HDD tray.
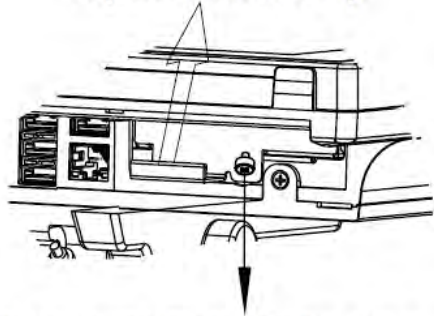
Step 2. Unsassemble the HDD fixing screw.

Printer Stand

Step 1.

Adjust LCD angle to zero degree.
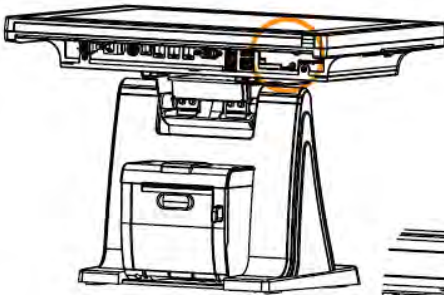
Step 3.
Pull out HDD tray.
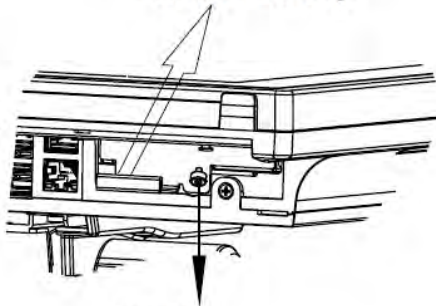
Step 2.
Unassemble the HDD fixing screw.

Easy Maintenance_Memory

Step 1. Set the Panel-PC and Stand apart from each other.

Normal Stand
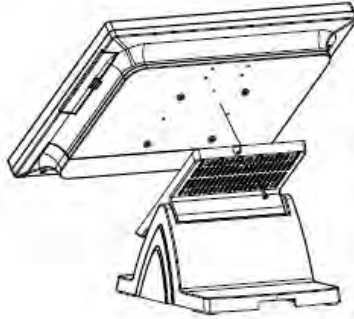
Printer Stand

Place the removed Panel PC on the table for maintenance.
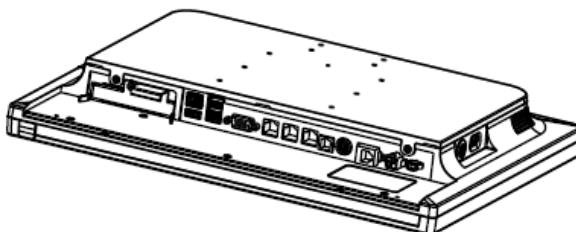
Panel PC

Step 1. Remove the two screws as shown:
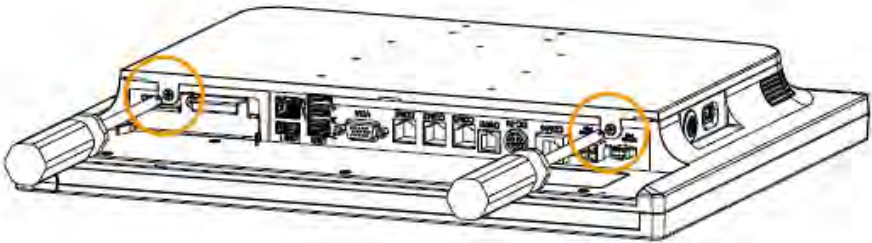
Step 2. Open and remove the back cover.
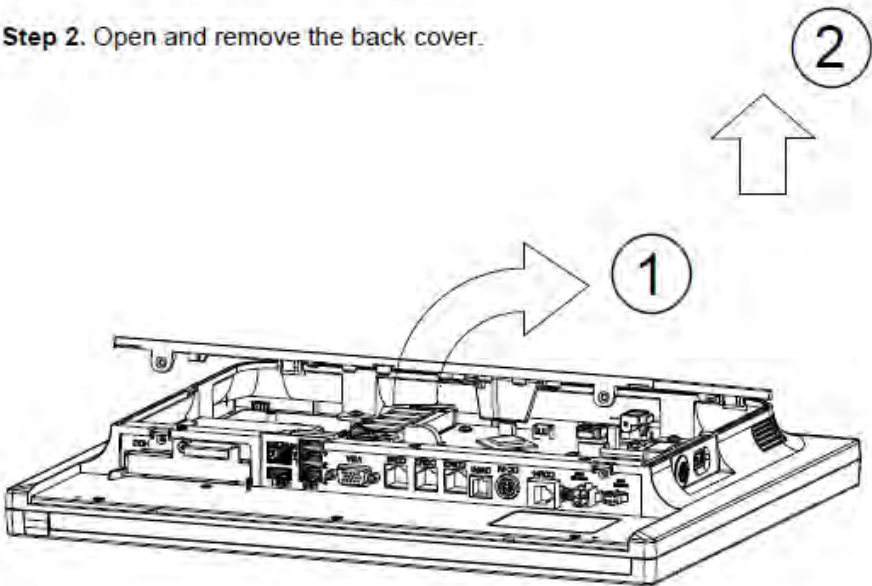
Step 3.
Take out the Memory.
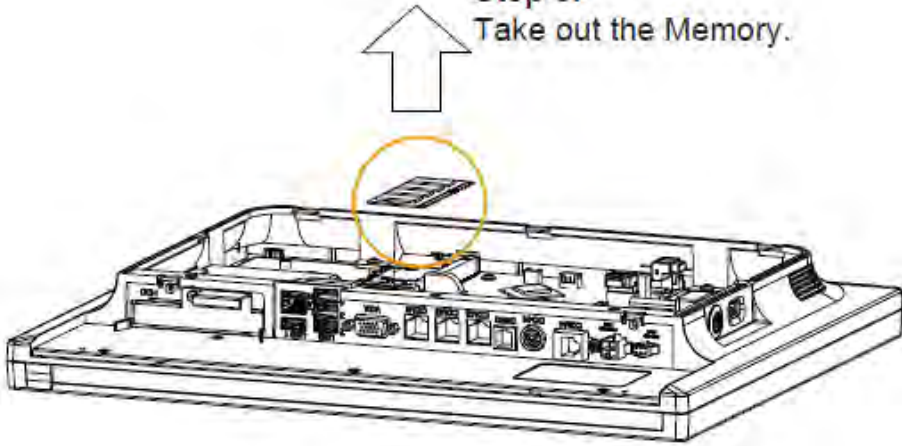
Easy Stand

Step 1. Remove the two screws as shown:
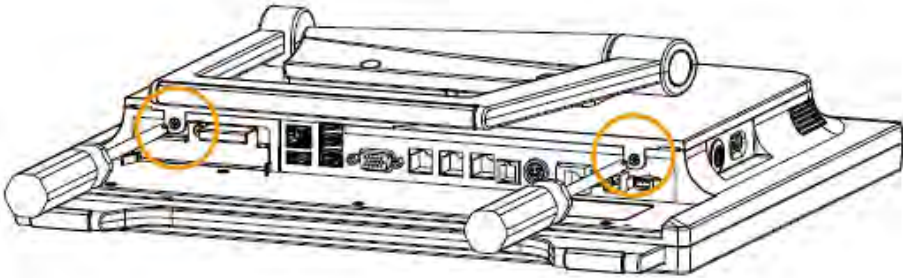
Step 2. Open and remove the back cover.
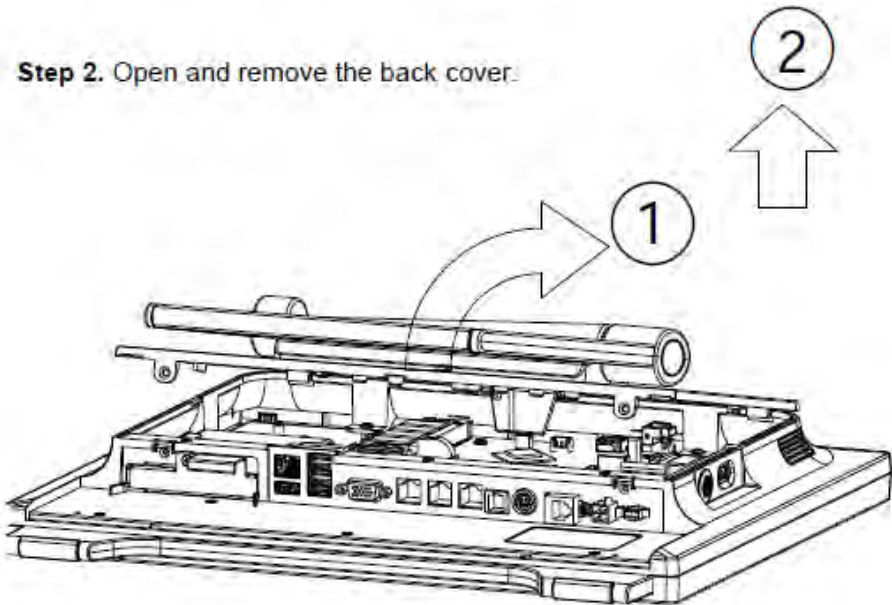
Step 3.
Take out the Memory.
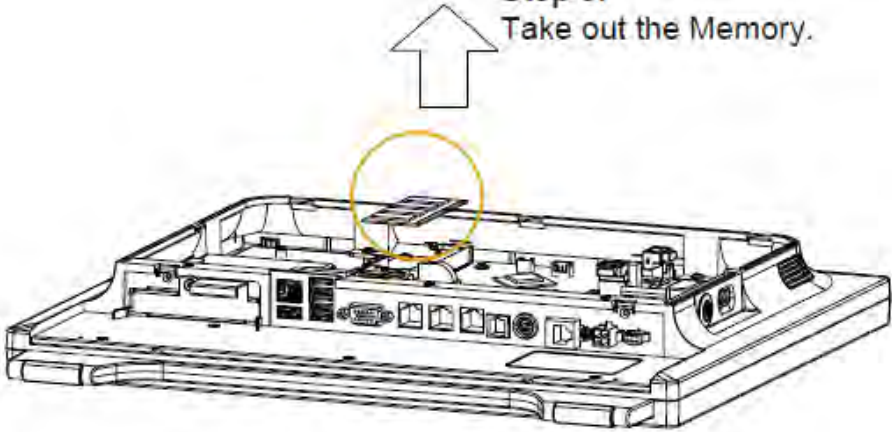
Easy Maintenance_Mainboard

Step 1.

Pull out all cables which are connected on M/B and then release the fixing screws on M/B.
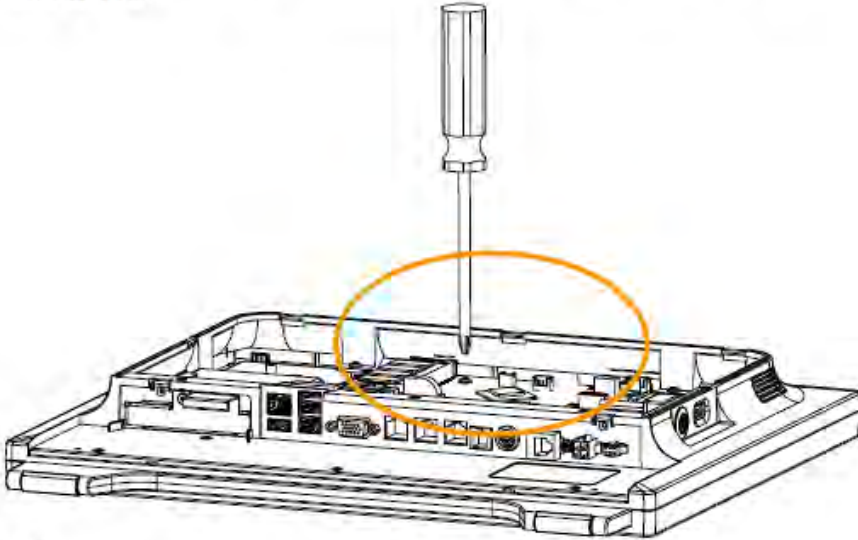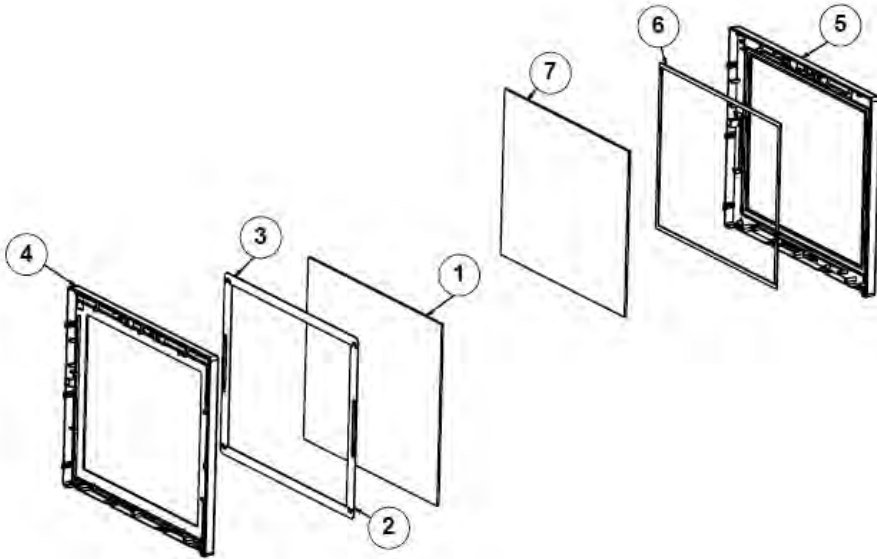
Step 2.

Follow the arrow direction to remove the Main Board.
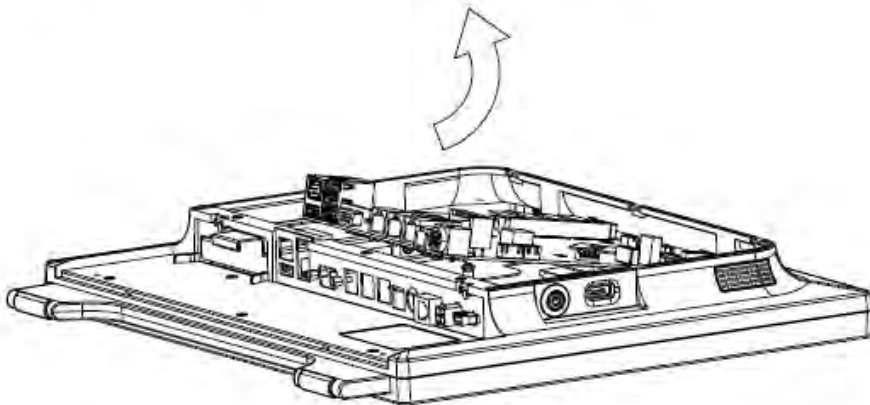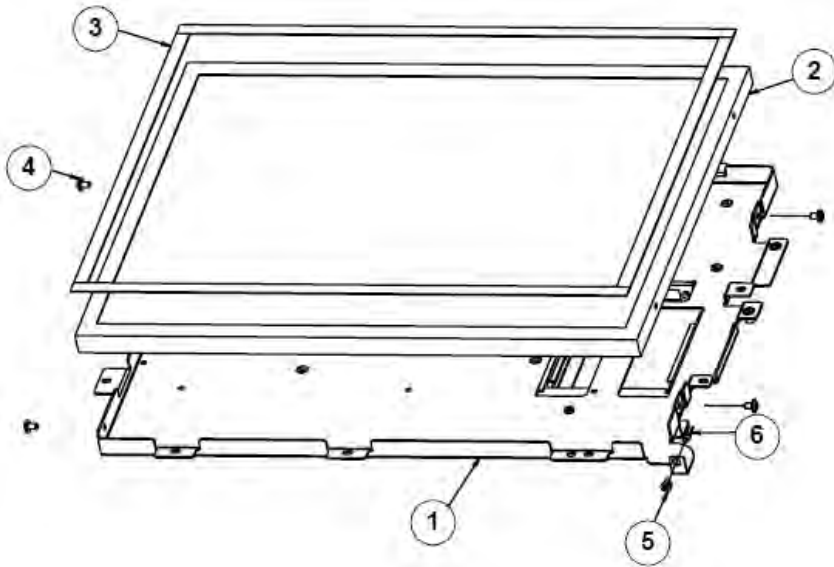
EXPLODED DIAGRAMS FOR PANEL PC
HDD Assembly
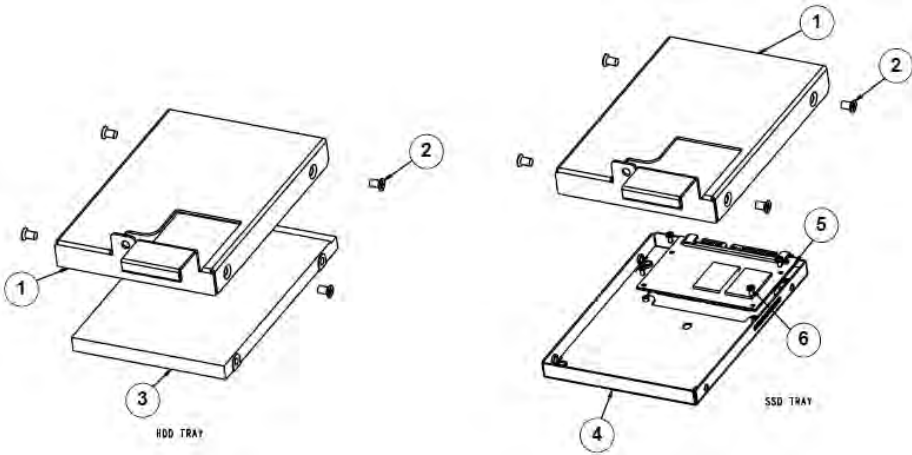
No.	Name	P/N No.	Q'ty
1	HDD TRAY	20-054-01001368	1
2	SCREW M3*L4	22-215-30004311	4
3	SATA HDD	By order	1
4	SSD BRACKET	80-006-01001316	1
5	SSD	By order	1
6	SCREW M1.6xL3	22-222-16003015	4

Touchscreen
Bezel-Free and Non-Bezel-Free

No.	Name	P/N No.	Q'ty
1	ELO TOUCH PANEL	52-380-00114701	1
	Abon TOUCH PANEL	52-380-00200114	1
	Capacitive Touch Panel	52-380-00150522	1
2	ELO Double Side Tape	94-026-04902220	2
	Abon Double Side Tape	94-026-05001220	2
3	ELO Double Side Tape	94-026-04901220	2
	Abon Double Side Tape	94-026-05001220	2
4	LCD FRONT COVER	30-002-28210368	1
5	LCD FRONT COVER NOFALT	30-002-28310368	1
6	EVA SPONGE	30-013-15100139	2
7	ELO TOUCH PANEL	52-351-03650511	1
	Abon TOUCH PANEL	52-380-00350114	1

LCD Panel Assembly

No.	Name	P/N No.	Q'ty
1	LCD-HOLDER-MODULE	20-029-03001368	1
2	LCD PANEL	52-351-03510728	1
	LCD PANEL	52-351-03015021	1
3	LCD PORON	30-013-24100000	4
4	SECRW M3*L5	22-242-30005311	4
5	LED HOUSING	30-014-04100165	1
6	LED CABLE	--	1

LCD Panel Assembly

No.	Name	P/N No.	Q'ty
1	LCD FRONT COVER ASSY	--	1
2	LCD-HOLDER-MODULE	--	1
3	TAPPING 3x L8	22-122-30080011	10

Inside Box
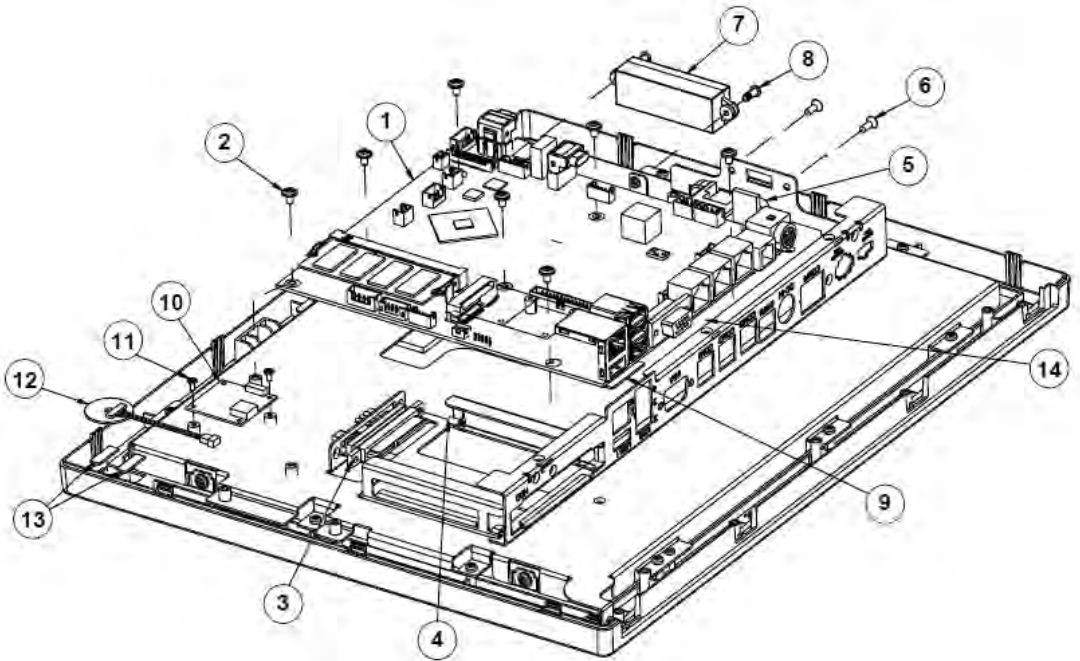
No.	Name	P/N No.	Q'ty
1	PB-6722	--	1
2	SECRW M3xL5	22-242-30005311	7
3	SATA CABLE	--	1
4	SCREW M3xL6	82-275-30006018	2
5	USB CABLE	--	1
6	SCREW UNC-N04-40-L8	22-315-40008019	2
7	SPEAKER	13-500-06350118	1
8	SCREW M3xL8	22-272-30008015	2
9	THERMAL PAD	--	1
10	RFID PCB	--	1
11	SCREW M2x4L	22-272-20004011	2
12	RFID ANT	--	1
13	RFID EVA	90-013-15700353	2
14	THERMAL PAD	--	1
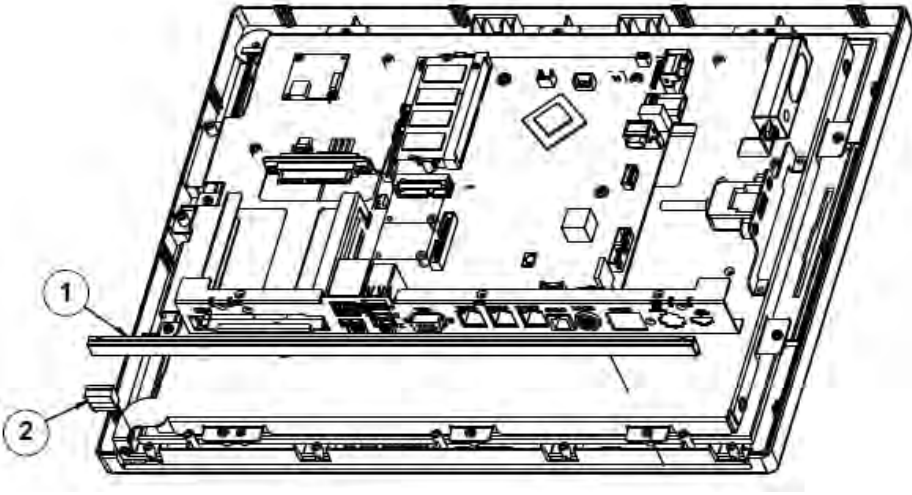
Panel PC

No.	Name	P/N No.	Q'ty
I	PMMA COVER	90-013-06300368	I
2	LENS	30-021-10130368	I
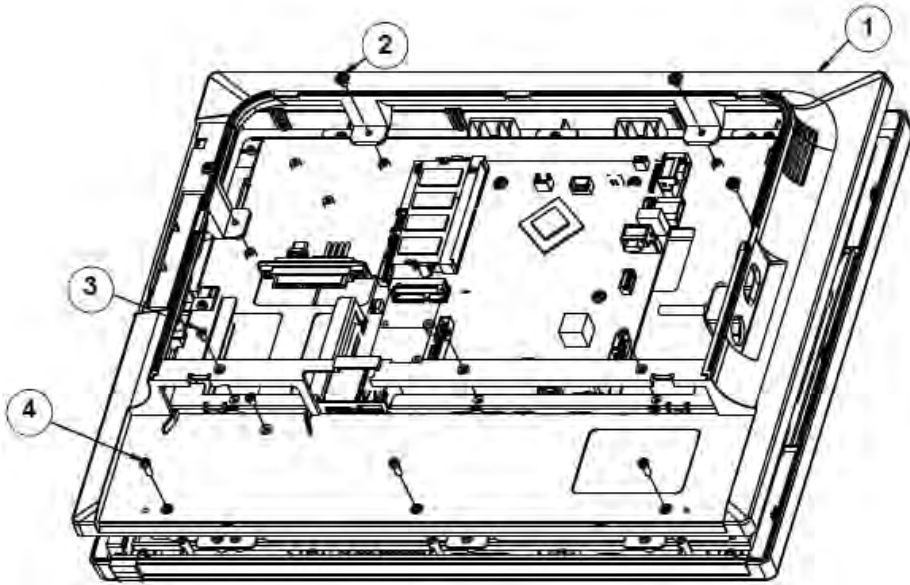
Panel PC Assembly

No.	Name	P/N No.	Q'ty
1	LCD REAR COVER	30-002-28410368	1
2	SCREW M3xL5	22-242-30005311	4
3	SCREW M3xL5	22-215-30005011	4
4	TAPPING 3xL8	22-122-30080011	3

Panel PC Assembly

No.	Name	P/N No.	Q'ty
1	POWER CABLE	--	1
2	2ND CABLE	--	1
3	PRINTER CABLE	--	1
4	COM 4 CABLE	--	1
5	SCREW M3xL5	22-242-3000531I	1
6	HDD TRAY ASSY	--	1
7	SCREW M3xL6	22-272-3000631I	1
8	CPU THERMAL PAD	--	1
9	HEX CU BOSS UNC No.4-40	22-692-4004805I	2

Panel PC Assembly

No.	Name	P/N No.	Q'ty
1	HEATSINK COVER	20-004-01061368	1
2	SCREW M3xL5	22-215-30005011	2
3	CABLE COVER	30-002-28110368	1
4	SCREW M3xL6	82-275-30006018	2
5	MSR COVER	30-002-28510368	1

Touchscreen
Bezel-Free and Non-Bezel-Free

No.	Name	P/N No.	Q'ty
1	ELO TOUCH PANEL	52-380-00114701	1
	Abon TOUCH PANEL	52-380-00200114	1
	Capacitive Touch Panel	52-380-00150522	1
2	ELO Double Side Tape	94-026-04902220	2
	Abon Double Side Tape	94-026-05001220	2
3	ELO Double Side Tape	94-026-04901220	2
	Abon Double Side Tape	94-026-05001220	2
4	LCD FRONT COVER	30-002-28210368	1
5	LCD FRONT COVER NOFALT	30-002-28310368	1
6	EVA SPONGE	30-013-15100139	2
7	ELO TOUCH PANEL	52-351-03650511	1
	Abon TOUCH PANEL	52-380-00350114	1

LCD Panel Assembly

No.	Name	P/N No.	Q'ty
1	LCD-HOLDER-MODULE	20-029-03001368	1
2	LCD PANEL	52-351-03510728	1
	LCD PANEL	52-351-03015021	1
3	LCD PORON	30-013-24100000	4
4	SECRW M3*L5	22-242-30005311	4
5	LED HOUSING	30-014-04100165	1
6	LED CABLE	--	1

LCD Panel Assembly

No.	Name	P/N No.	Q'ty
I	LCD FRONT COVER ASSY	--	I
2	LCD-HOLDER-MODULE	--	I
3	TAPPING 3x L8	22-122-30080011	I0

Inside Box

No.	Name	P/N No.	Q'ty
1	PB-6722	--	1
2	SECRW M3xL5	22-242-30005311	7
3	SATA CABLE	--	1
4	SCREW M3xL6	82-275-30006018	2
5	USB CABLE	--	1
6	SCREW UNC-NO4-40-L8	22-315-40008019	2
7	SPEAKER	13-500-06350118	1
8	SCREW M3xL8	22-272-30008015	2
9	THERMAL PAD	--	1
10	RFID PCB	--	1
11	SCREW M2x4L	22-272-20004011	2
12	RFID ANT	--	1
13	RFID EVA	90-013-15700353	2
14	THERMAL PAD	--	1

Panel PC with Easy Stand Assembly

No.	Name	P/N No.	Q'ty
1	PMMA	30-068-10130368	1
2	PMMA RUBBER	90-013-06100368	2
3	TAPPING 3xL5	22-132-30005011	4

Panel PC with Easy Stand Assembly
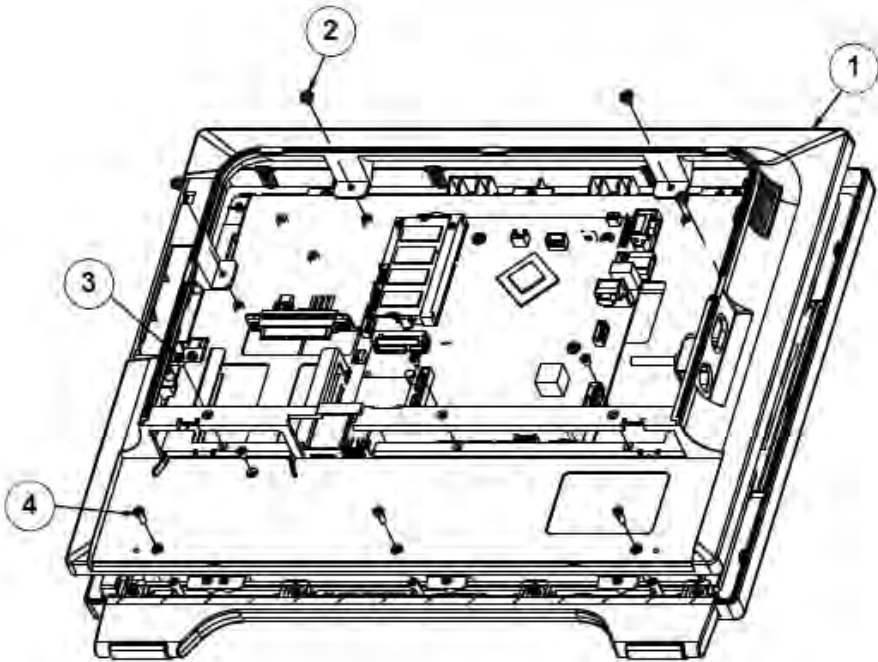
No.	Name	P/N No.	Q'ty
1	LCD REAR COVER	30-002-28410368	1
2	SCREW M3xL5	22-242-30005311	4
3	SCREW M3xL5	22-215-30005011	4
4	TAPPING 3xL8	22-122-30080011	3

Panel PC with Easy Stand Assembly
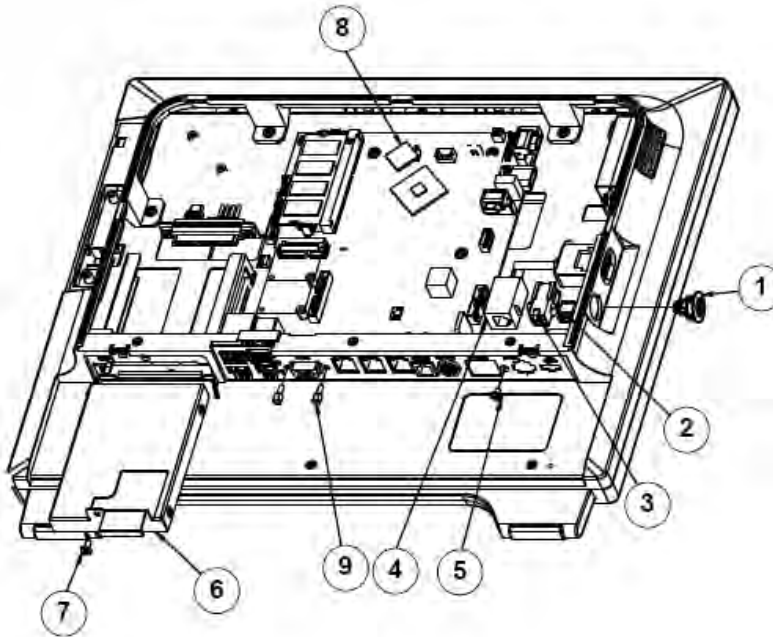
No.	Name	P/N No.	Q'ty
1	POWER CABLE	--	1
2	2ND CABLE	--	1
3	PRINTER CABLE	--	1
4	COM 4 CABLE	--	1
5	SCREW M3xL5	22-242-30005311	1
6	HDD TRAY ASSY	--	1
7	SCREW M3xL6	22-272-30006311	1
8	CPU THERMAL PAD	--	1
9	HEX CU BOSS UNC No.4-40	22-692-40048051	2

Metal Cover Assembly
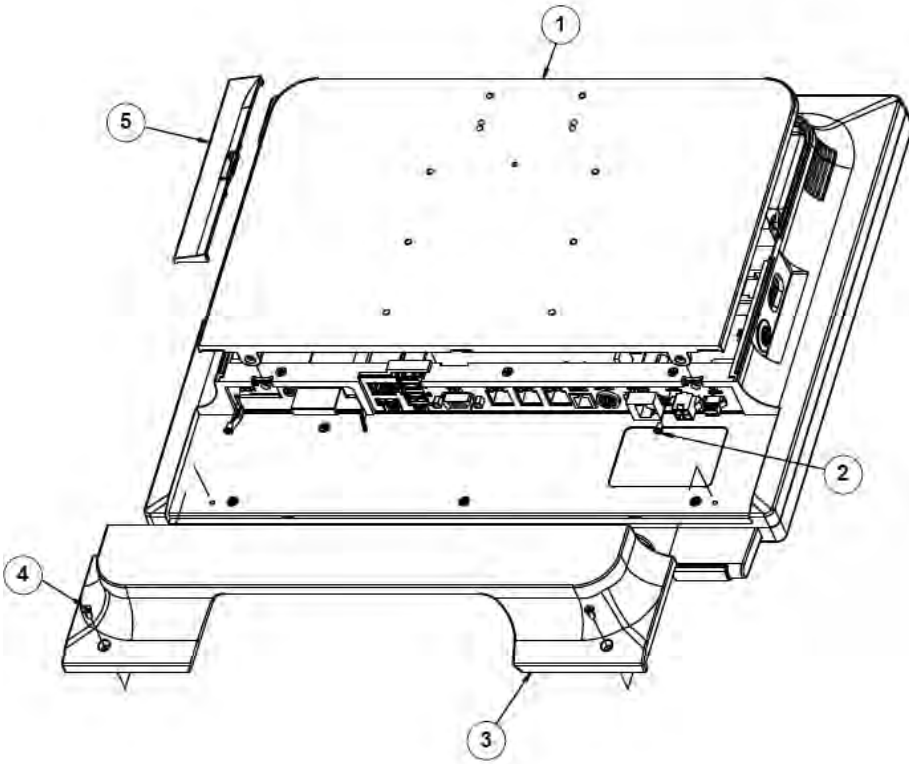
No.	Name	P/N No.	Q'ty
1	HEATSINK COVER	20-004-01061368	1
2	SCREW M3xL5	22-215-30005011	2
3	CABLE COVER	30-002-28110368	1
4	SCREW M3xL6	82-275-30006018	2
5	MSR COVER	30-002-28510368	1

Easy Stand
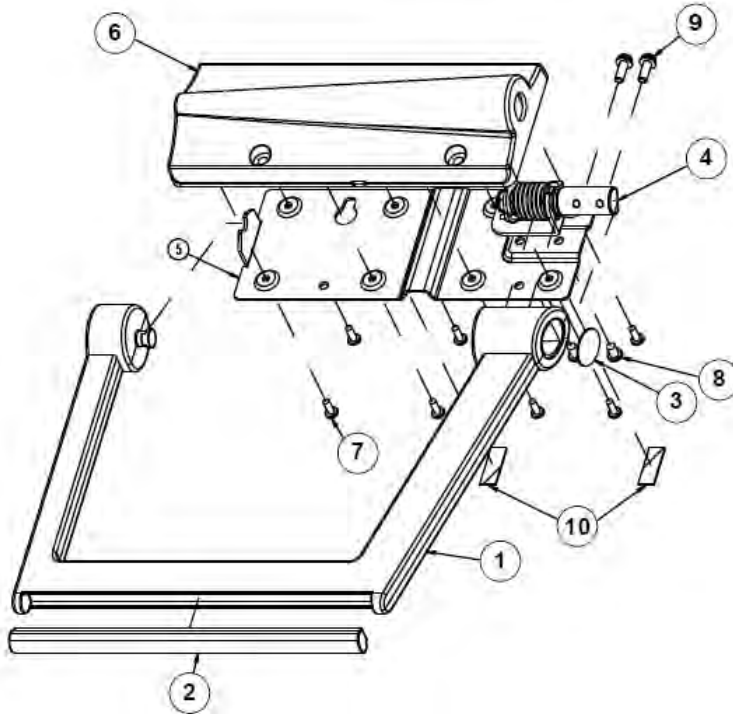
No.	Name	P/N No.	Q'ty
1	STAND	20-017-01061368	1
2	STAND RUBBER	90-013-06200368	1
3	STAND MYLAR	30-056-02100368	1
4	HINGE	20-012-21001368	1
5	STAND COVER SUPPORT	20-002-03001368	1
6	STAND COVER	30-002-28610368	1
7	TAPPING 3xL8	22-172-30008011	8
8	SCREW M4xL6	22-275-40006011	2
9	SCREW M4xL10	22-232-40012211	2
10	RUBBER	30-013-06400368	2

Easy Stand Assembly
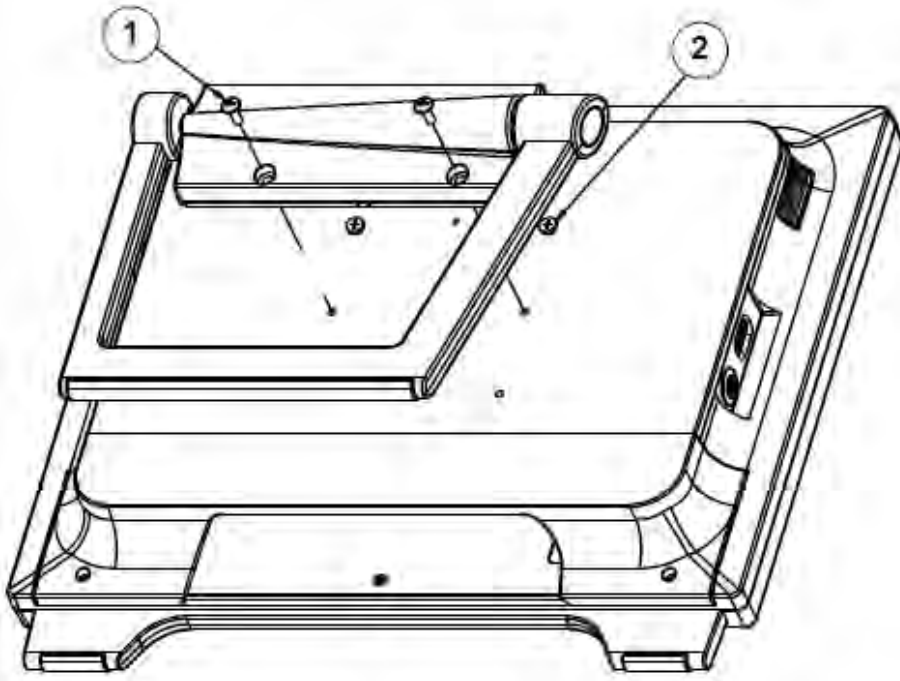
No.	Name	P/N No.	Q'ty
1	SCREW M4xL12	22-245-40012031	2
2	SCREW M4xL4	22-272-40004911	2

EXPLODED DIAGRAMS FOR STAND
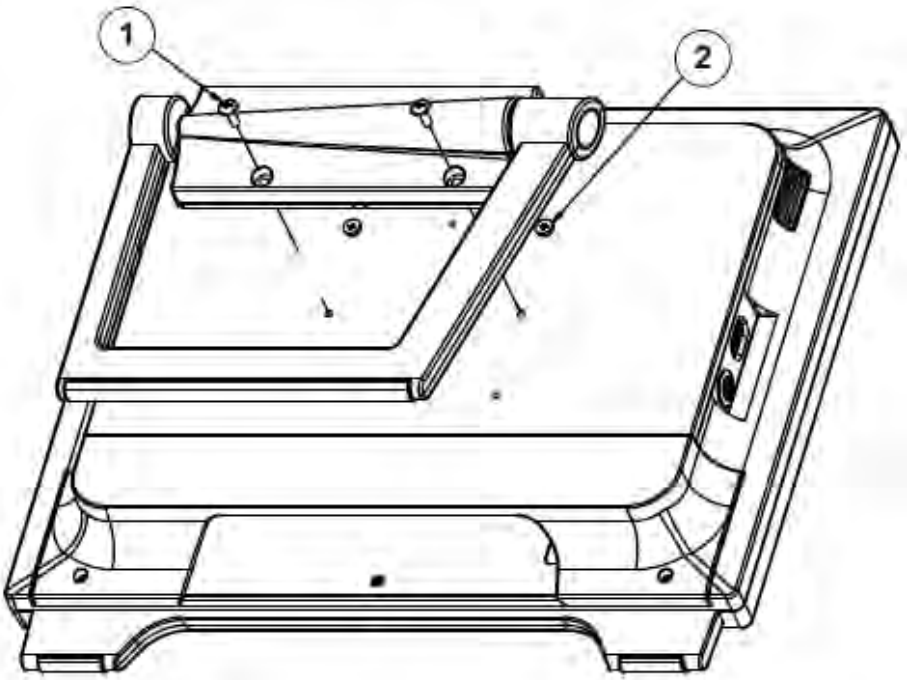
No.	Name	P/N No.	Q'ty
1	SCREW M4xL12	22-245-40012031	2
2	SCREW M4xL4	22-272-40004911	2

Easy Stand
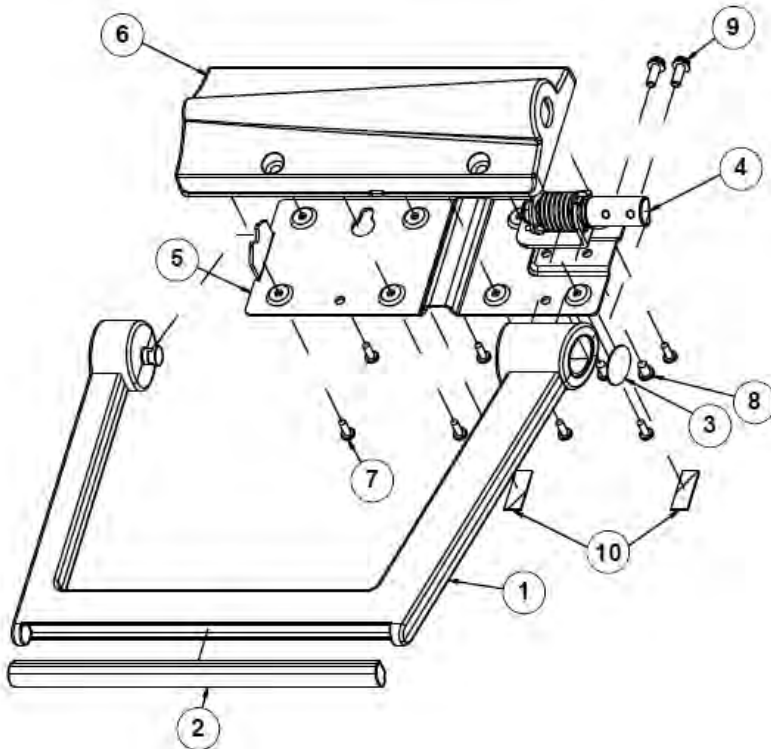
No.	Name	P/N No.	Q'ty
1	STAND	20-017-01061368	1
2	STAND RUBBER	90-013-06200368	1
3	STAND MYLAR	30-056-02100368	1
4	HINGE	20-012-21001368	1
5	STAND COVER SUPPORT	20-002-03001368	1
6	STAND COVER	30-002-28610368	1
7	TAPPING 3xL8	22-172-30008011	8
8	SCREW M4xL6	22-275-40006011	2
9	SCREW M4xL10	22-232-40012211	2
10	RUBBER	30-013-06400368	2

Normal Stand
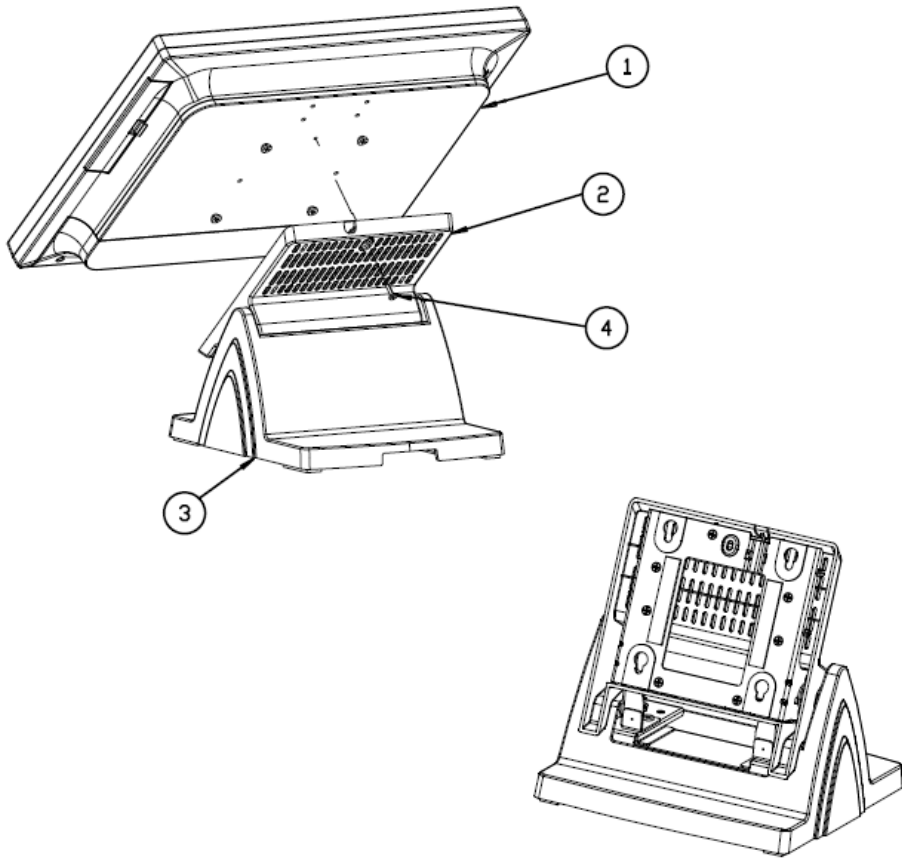
Item	Qty	Part Name	Part No.
1	1	PA-6322_PPC_MODULE	--------
2	1	PA-6151_ROTATE_MODULE	--------
3	1	PA-6151_STAND_MODULE	--------
4	1	RW_SCREW_M3_L15mm	22-235-30015011

Rotation Part (1)
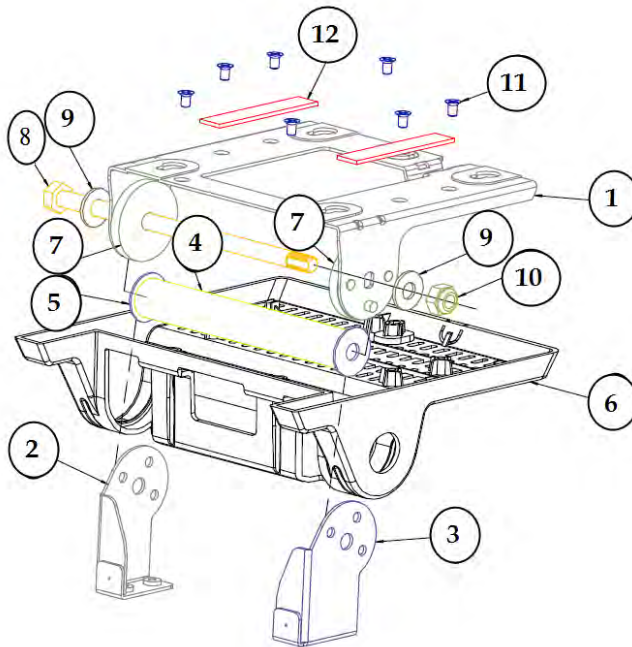
	Part Name	Part No.	Qty
1	POS-6920_ROTATE_SUPPORT	80-002-03003226	1
2	L_SUPPORT	80-002-03002226	1
3	R_SUPPORT	80-002-03001226	1
4	POS-6920_PIPE	80-056-02001226	1
5	WASHER_ID_8.5_OD_24	23-202-09150247	2
6	POS-6920_ROTATE_COVER	30-002-28610226	1
7	PS5000_HINGE_SPACER	30-041-04100139	2
8	HEX_SCREW_M8_L154mm	22-252-80154005	1
9	PLAIN_WASHER_D8_D19_T1.5	23-202-08150191	2
10	HEX_NUTS_M8_L7.85mm	23-142-80081291	1
11	FLAT_SCREW_T4_L7mm	22-112-40007015	7
12	SILICON RUBBER PAD	90-036-06200226	2

Bottom Case (1)
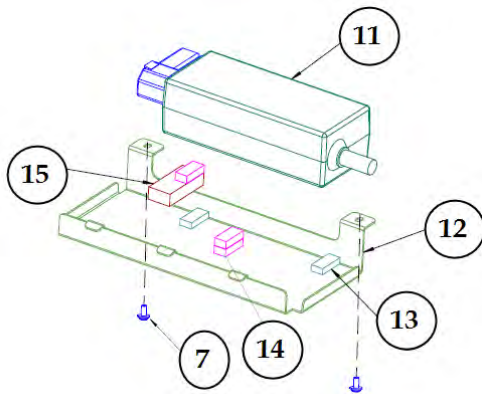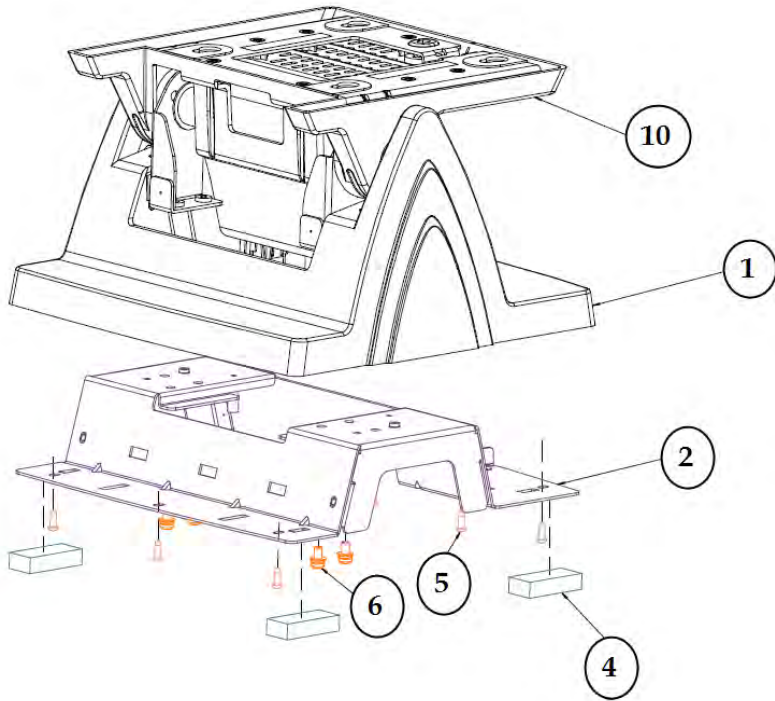
Item	Part Name	Part No.	Qty
1	POS-6920-STAND-COVER	30-002-28710226	1
2	POS-6920-STAND-BASE	80-032-03001226	1
4	RUBBER FOOT	30-004-01600000	4
5	TAPPING_SCREW,T3.0X8mm	22-122-30080011	9
6	R_S_SCREW,M4.0X0.55PX8mm	22-232-40008211	4
7	R_W_SCREW,M3.0X0.5PX6mm	22-232-30006311	2
10	POS-6920_ROTATE_MODULE	------------	1
11	60W Power Adapter	52-002-10068302	1
12	PA-6970 POWER HOLDER	80-029-03001253	1
13	RUBBER FOOT(18x8x4mm)	90-004-06100238	2
14	RUBBER FOOT(18x8x5mm)	90-004-06400000	3
15	RUBBER FOOT(35x15x8mm)	30-004-01600000	1

Big Stand
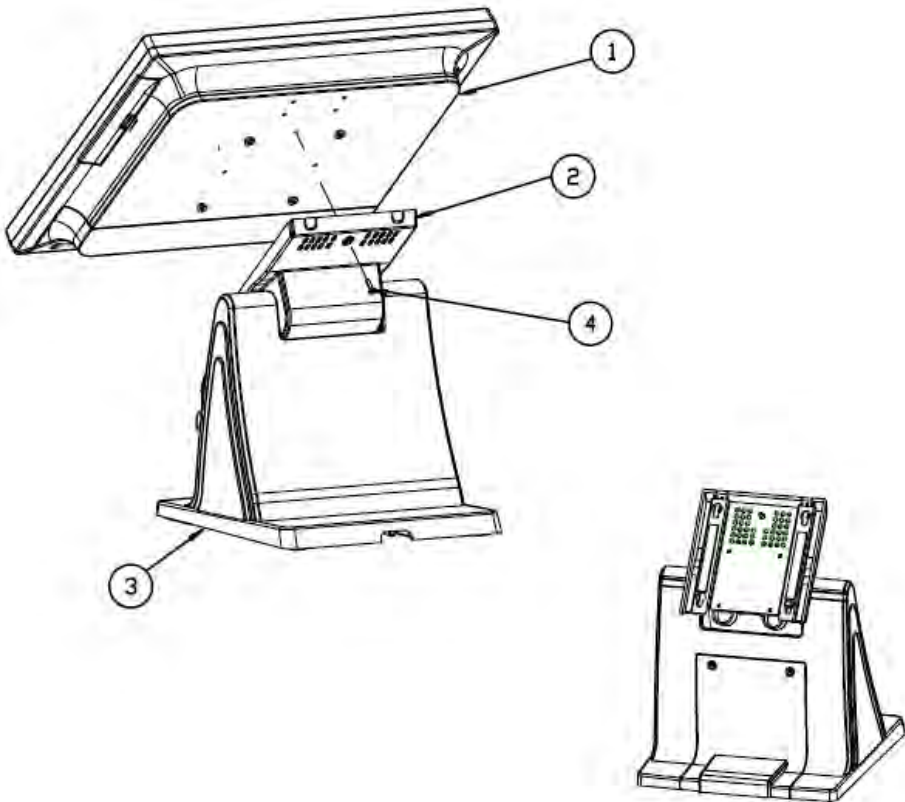
Item	Qty	Part Name	Part No.
1	1	PA-6322_PPC_MODULE	--------
2	1	PA-6225_ROTATE_MODULE	--------
3	1	PA-6225_STAND_MODULE	--------
4	1	RW_SCREW_M3_L15mm	22-235-30015011

Rotation Part (2)
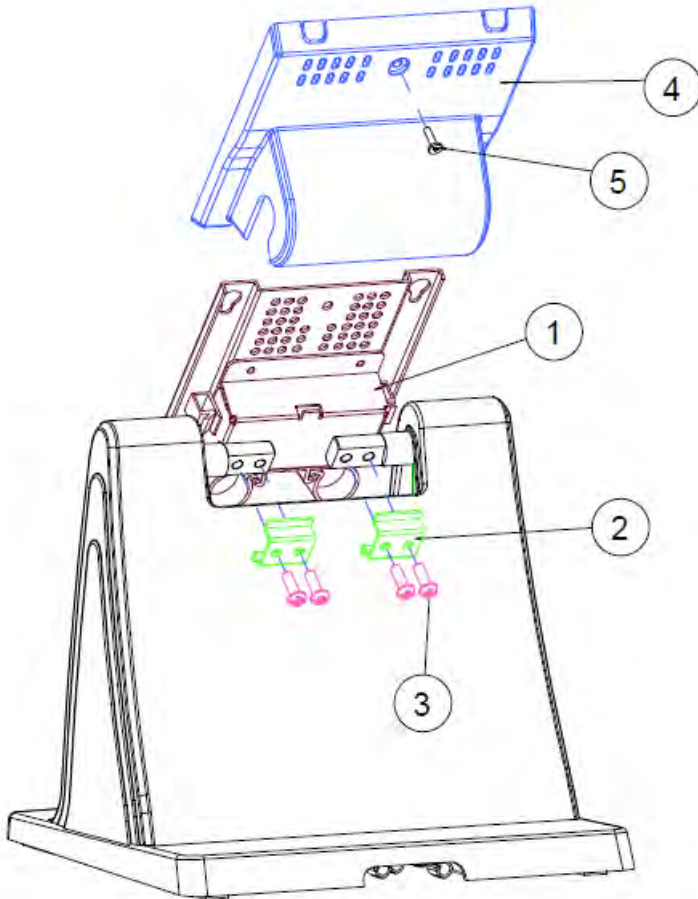
Item	Qty	Part Name	Part No.
1	1	Rotate base assembly	xx-xxx-xxxxxxx
2	2	HINGE-FIXING	80-012-03001314
3	4	SCREW/M5x0.8Px15mm	22-232-50015011
4	1	Stand Rotate Cover	30-002-28410314
5	1	SCREW/M3x0.5Px12mm	22-275-30010011
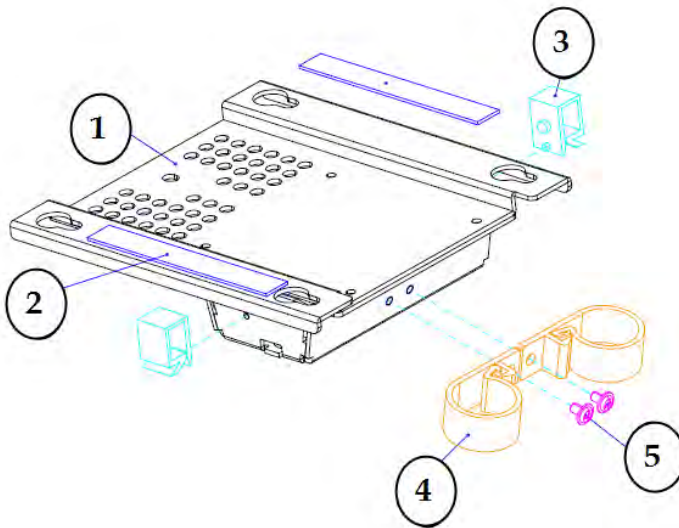
Item	Qty	Part Name	Part No.
1	1	ROTATE-BASE	20-032-03001314
2	2	ROTATE_BASE-SPONGE	30-013-24100314
3	2	CABLE CLAMP	90-042-04100314
4	2	CABLE CLAMP	30-042-04100314
5	2	M3 Screw	22-242-30005311

Bottom Case (2)
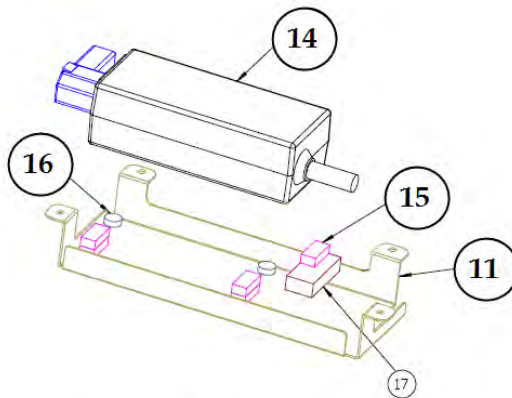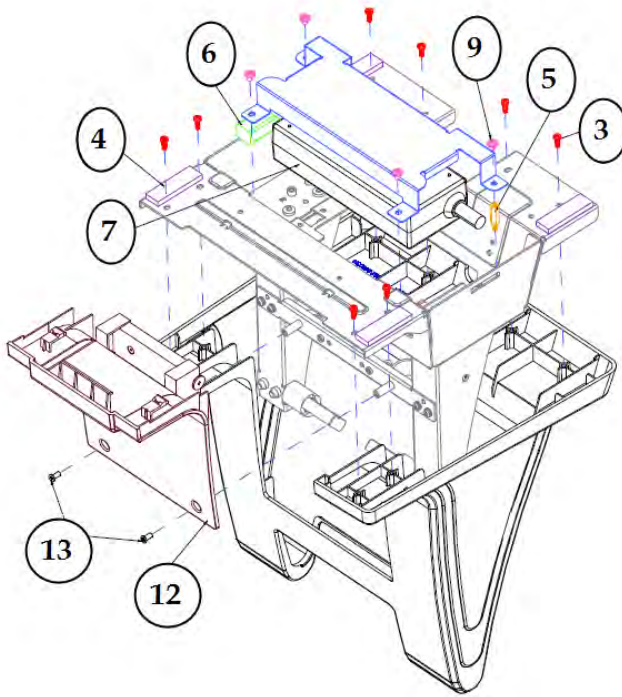
60W_POWER_ADAPTER

Item	Q'ty	Part Name	Part No.	Note
3	8	SCREW/T3.0x8mm	22-122-30080011	
4	4	RUBBER FOOT (40x12x4mm)	30-004-01100314	
5	1	HEX CU BOSS/M3x0.5Px6L, H=15	22-290-30015051	
7	1	72W Adaptor	xx-xxx-xxxxxxx	
9	4	SCREW/M3x0.5Px5mm	22-242-30005311	
12	1	No Printer cover assembly	xx-xxx-xxxxxxx	
13	2	SCREW/M3x0.5Px6mm	82-275-30006018	
11	1	120W_ADAPTOR_BRACKET	80-029-03003314	
14	1	60W_Power_Adaptor	52-002-10068302	
15	5	RUBBER FOOT (18x8x5mm)	90-004-06400000	
16	2	RUBBER FOOT (Φ9x3.2mm)	90-004-06500000	
17	1	RUBBER FOOT (35x15x8mm)	30-004-01600000	
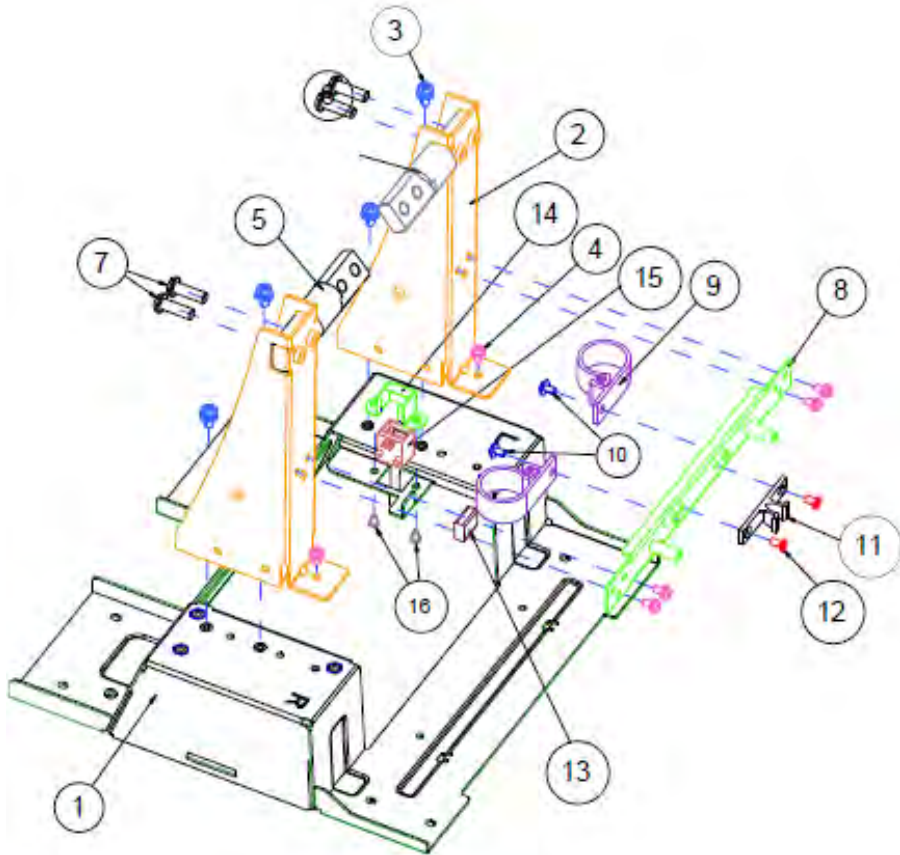
Item	Q'ty	Part Name	Part No.
1	1	STAND_BASE_BRACKET	80-006-03005314
2	2	STAND_SUPPORT_BRACKET	80-006-03007314
3	4	SCREW/M4x0.7Px8mm	22-232-40008211
4	6	SCREW/M3x0.5Px6mm	22-232-30060211
5	1	STAND HINGE R	20-012-29002314
6	1	STAND HINGER L	20-012-29001314
7	4	SCREW/M5x0.8Px15mm	22-232-50015011
8	1	STAND_LINK_BRACKET	80-006-03006314
9	2	CABLE CLAMP	90-023-04100314
10	2	SCREW/M3x0.5Px5mm	22-242-30005311
11	1	LATCH	90-023-09100000
12	2	SCREW/M3x0.5Px6mm	22-212-30006011
13	1	EM SHIELDING GASKET	90-050-31100000
14	1	RJ11 HOLDER	80-029-03002165
15	1	Cash Drawer cable	27-026-16505111
16	2	SCREW/M2x0.45Px4mm	22-232-25004011
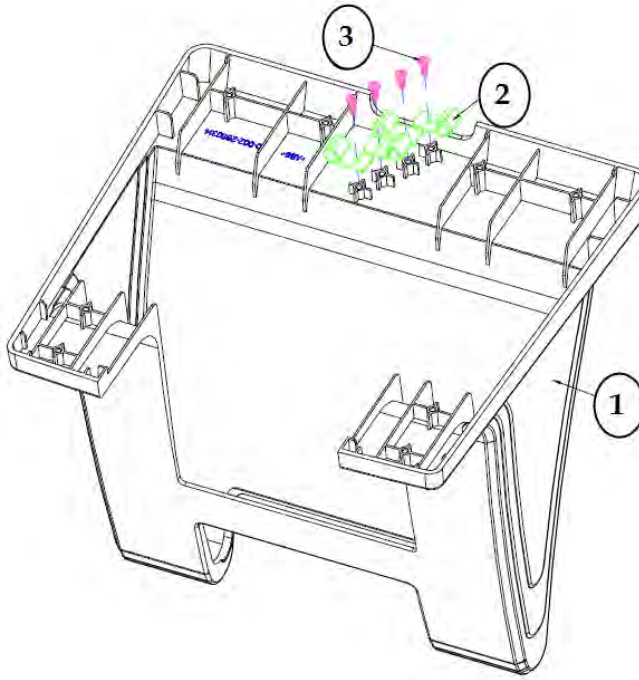
Item	Qty	Part Name	Part No.
1	1	Stand Cover	30-002-28110314
2	4	CABLE CLAMP	90-023-04200314
3	4	SCREW/T3.0x8mm	22-122-30080011

Print Stand
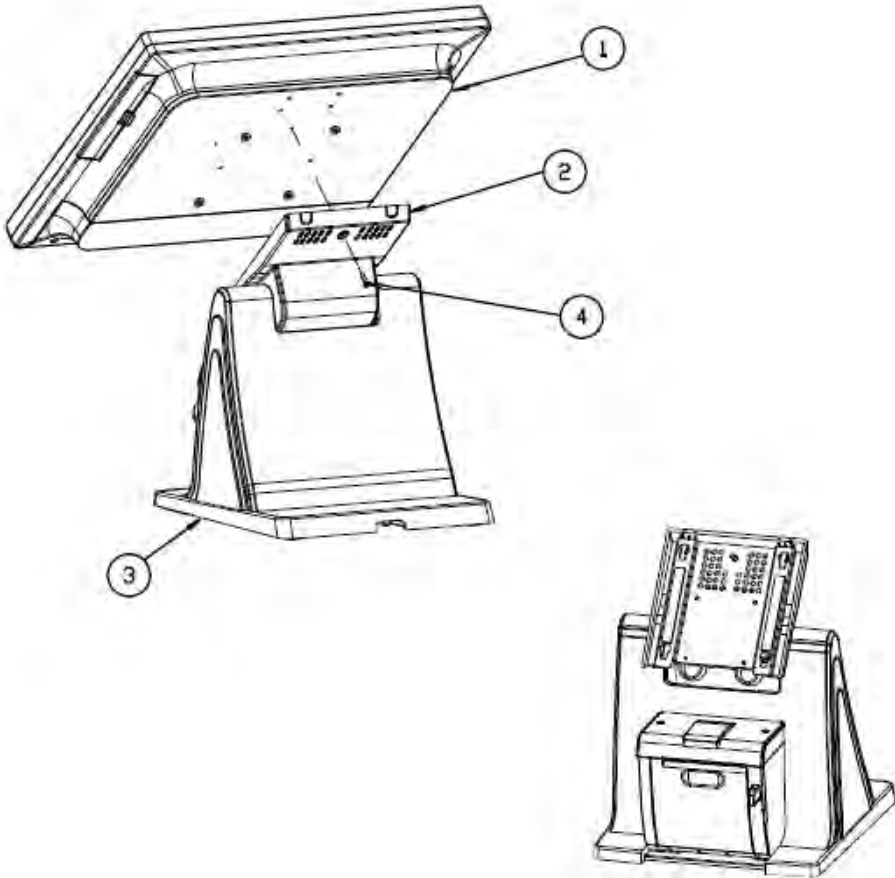
Item	Qty	Part Name	Part No.
1	1	PA-6322_PPC_MODULE	--------
2	1	PA-6225_ROTATE_MODULE	--------
3	1	PA-6225_STAND_MODULE	--------
4	1	RW_SCREW_M3_L15mm	22-235-30015011

Extension Power Cable
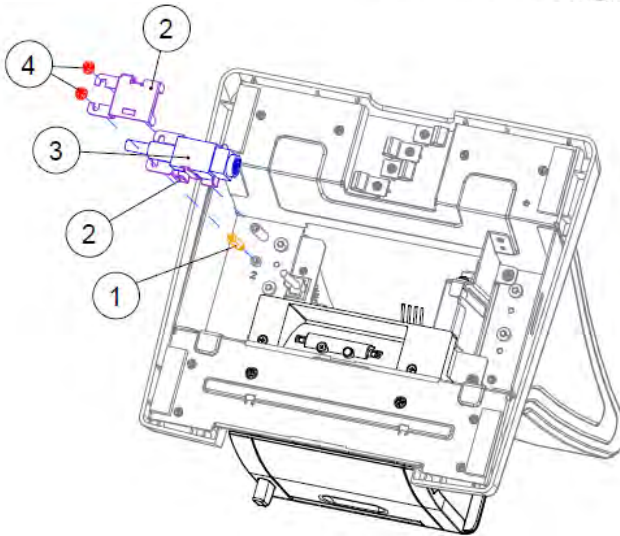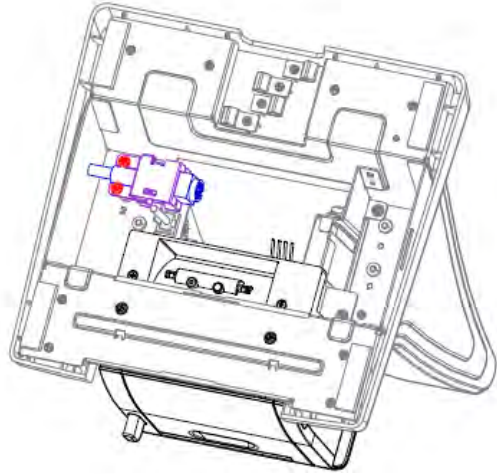
Item	Qty	Part Name	Part No.
1	1	HEX CU BOSS/M3x0.5Px6L,H=15mm	22-290-30015051
2	2	DC IN CLIP	80-014-03001314
3	1	DC IN EXTENDED CABLE	27-012-31408111
4	2	SCREW/M3x0.5Px5mm	22-242-30005311

EXPLODED DIAGRAMS FOR Printer Module

Front view

Rear view

Bottom view
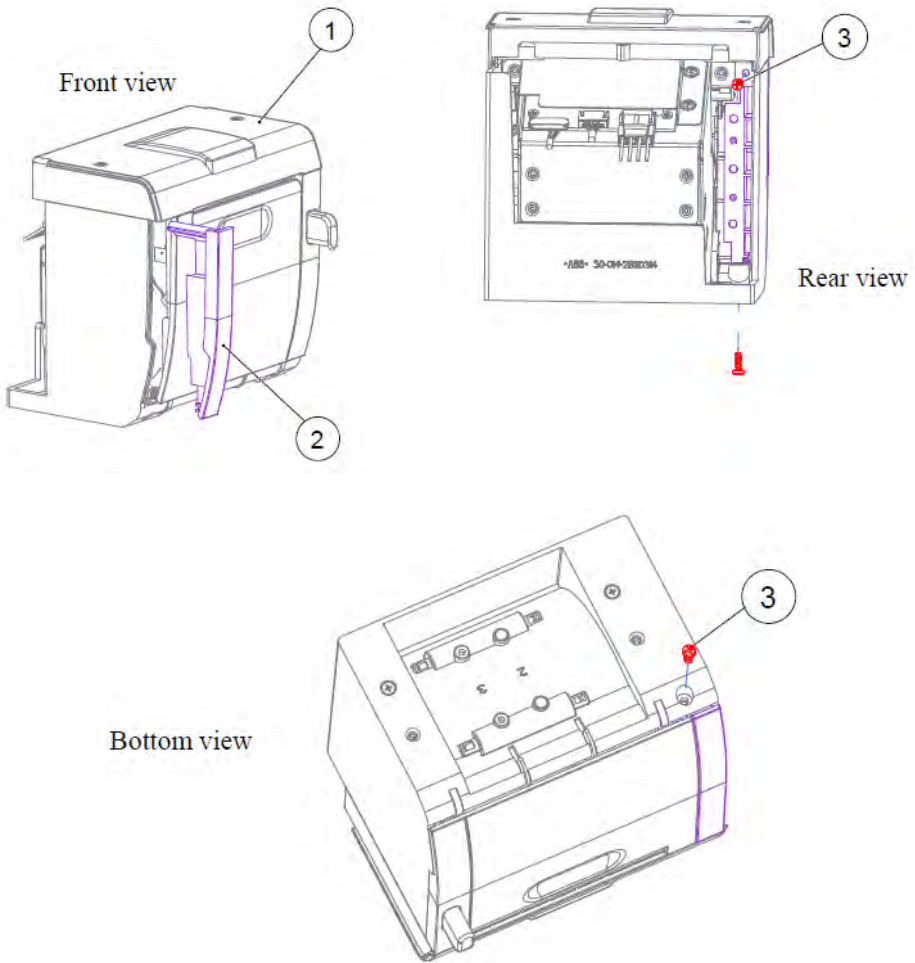
Item	Qty	Part Name	Part No.
1	1	Printer Module	xx-xxx-xxxxxxxx
2	1	STAND HDD COVER	30-002-02110314
3	2	SCREW/T3.0x8mm	22-122-30080011

Thermal Printer
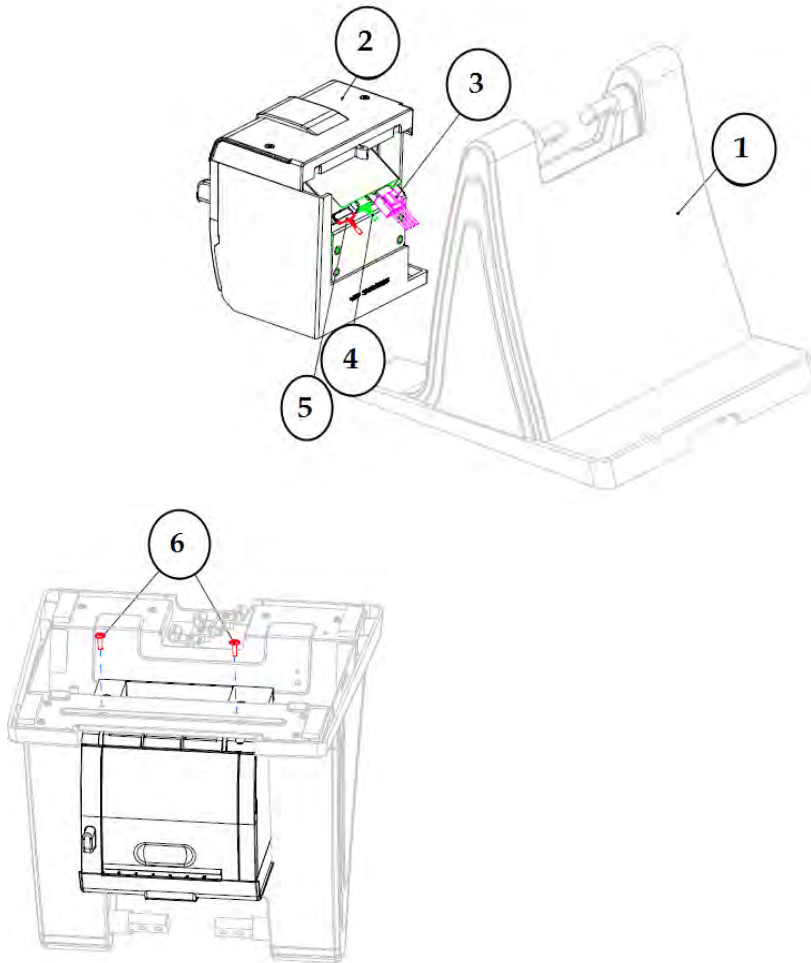
Item	Qty	Part Name	Part No.	Note
1	1	HDD-SOCKET_ASSEMBLY	xx-xxx-xxxxxxxx	
2	1	Printer Module_wih_HDD Cover	xx-xxx-xxxxxxxx	
3	1	PRINT POWER CABLE	27-012-31409071	
4	1	PRINT FOR USB CABLE	27-006-31409111	
	0	PRINT FOR USB CABLE	27-006-31409112	
	0	PRINT FOR COM CABLE	27-051-31408111	
	0	PRINT FOR COM CABLE	27-051-31408113	
	0	PRINT FOR COM CABLE	27-051-31408112	
5	1	Cash Drawer cable	27-026-16505111	Option
6	2	SCREW/M3x0.5Px10mm	22-232-30010311	
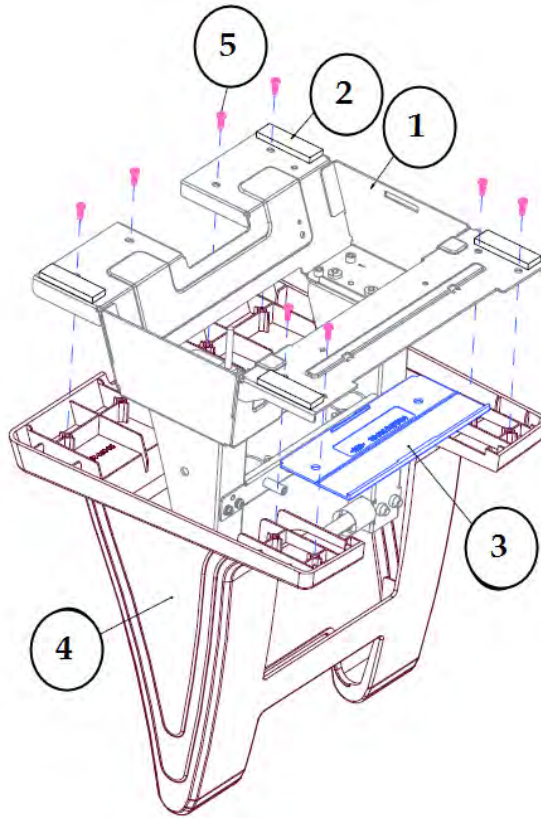
Item	Qty	Part Name	Part No.	Note
1	1	STAND BRACKET ASSEMBLY	xx-xxx-xxxxxxxx	
2	4	RUBBER FOOT	30-004-01100314	
3	1	STAND DRESS COVER	30-002-28510314	For with Printer
4	1	STAND COVER ASSEMBLY	xx-xxx-xxxxxxx	
5	8	SCREW/T3.0x8mm	22-122-30080011	

Top view
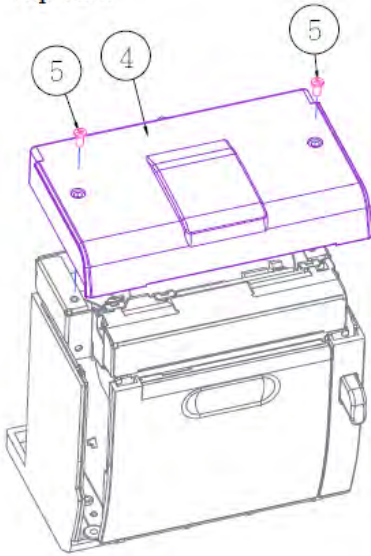
Bottom view
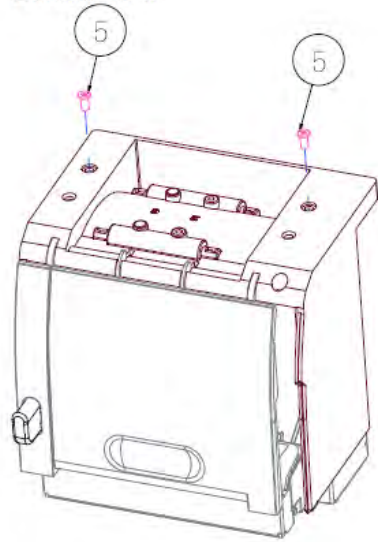
Separation view
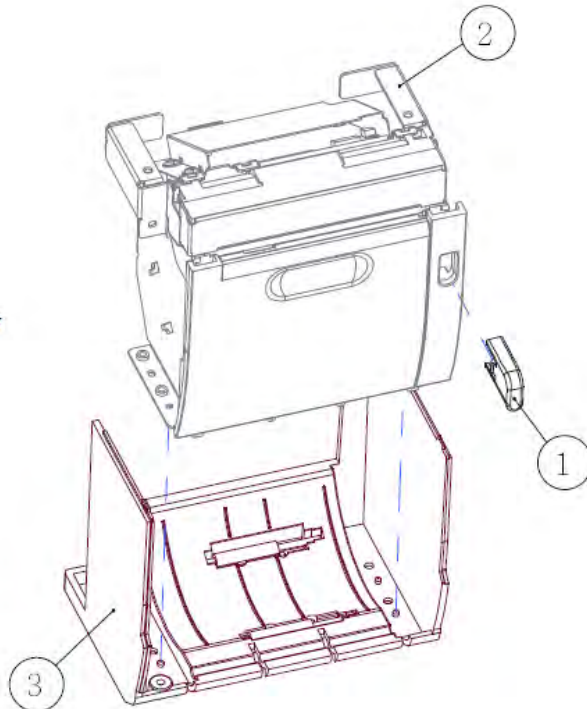
Item	Qty	Part Name	Part No.
1	1	Printer Door Switch	30-007-28110314
2	1	Printer Holder Assembly	xx-xxx-xxxxxxxx
3	1	Housing Assembly	xx-xxx-xxxxxxxx
4	4	SCREW/M3x0.5Px6mm	82-275-30006018
5	1	Stand Printer Cover	30-002-28310314

3 Inch Printer

Item	Qty	Part Name	Part No.
1	1	Stand Printer Housing	30-014-28110314
2	2	SPACER SUPPORTϕ6x25mm)	30-041-04100165
3	2	ROLLER PIN	20-045-19012199
4	2	**CANOE CLIPϕ2.9mm**	**90-042-04100000**

3 Inch Printer Assembly

Item	Part Name	Part No.	Qty
1	Printer Holder	80-029-03004314	1
2	Printer Board	17-122-10301028	1
	Printer Board	52-370-06310008	0
	Printer Board	17-160-10011023	0
3	SCREW/M2x0.4Px4mm	22-272-20004011	8
4	PRINTER-PCB-MYLAR	90-056-02100314	1
5	SCREW/M3x0.5Px5mm	22-242-30005311	4
6	3" Printer (Main body)	52-701-03017003	1
7	Front Cover Assembly	xx-xxx-xxxxxxxx	1
8	PAPER COVER PIN	20-004-10011165	1
9	ROTRAY DAMPER(15gf-cm)	90-022-09100314	1
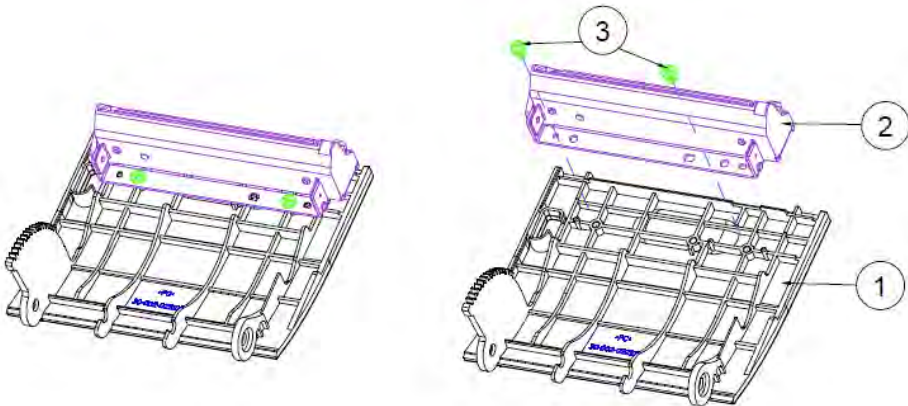
Item	Qty	Part Name	Part No.
1	1	STAND PRINTER COVER_F	30-002-02210314
2	1	3" Printer (Main body)	52-701-03017003
3	2	SCREW/T3.0x5mm	22-121-30005011

2 Inch Printer
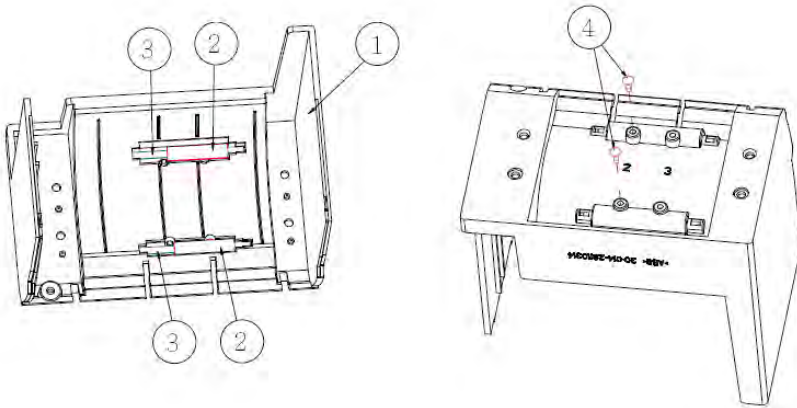
Item	Qty	Part Name	Part No.
1	1	Stand Printer Housing	30-014-28110314
2	2	SPACER SUPPORT Ø6x25mm)	30-041-04100165
3	2	ROLLER PIN	20-045-19012199
4	2	**CANOE CLIP Ø2.9mm**	**90-042-04100000**

2 Inch Printer Assembly

Step-1:
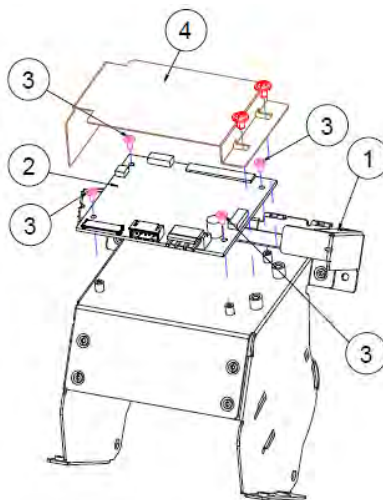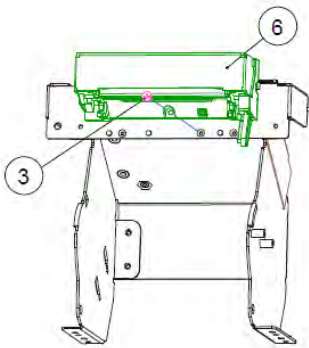
Step-2:   Step-3:
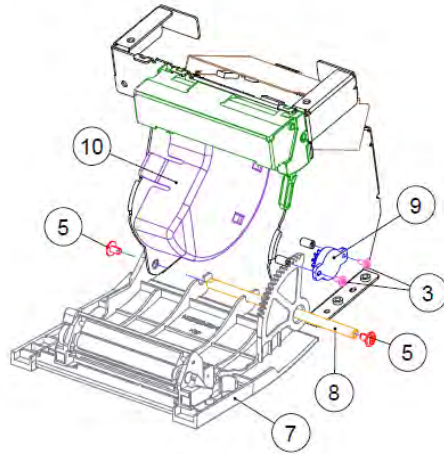
Item	Part Name	Part No.	Qty
1	Printer Holder	80-029-03004314	1
2	Printer Board	PDAC3100-D1	1
	Printer Board	MB-1030RB/RC	0
	Printer Board	MB-1011(3)RC	0
3	SCREW/M2x0.4Px4mm	22-272-20004011	7
4	PRINTER-PCB-MYLAR	90-056-02100314	1
5	SCREW/M3x0.5Px5mm	22-242-30005311	4
6	2" Printer (Main body)	52-701-01020003	1
7	Front Cover Assembly	xx-xxx-xxxxxxxx	1
8	PAPER COVER PIN	20-004-10011165	1
9	ROTRAY DAMPER(15gf-cm)	90-022-09100314	1
10	2 inch PAPER BLOCK	30-061-28110242	1
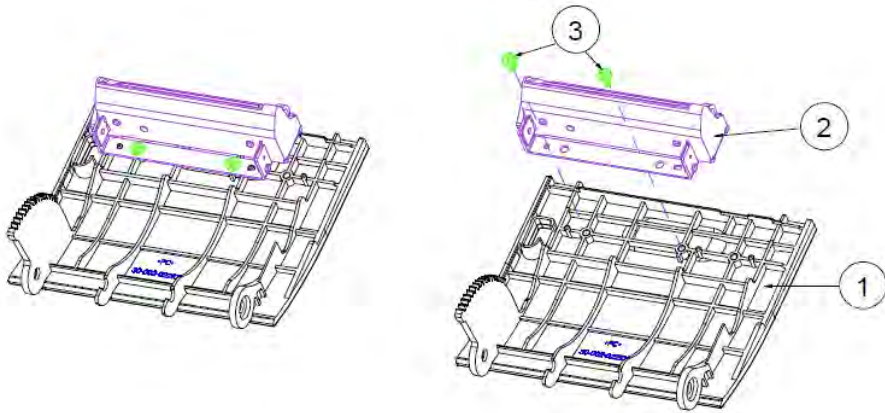
Item	Qty	Part Name	Part No.
1	1	STAND PRINTER COVER_F	30-002-02210314
2	1	2" Printer (Main body)	52-701-01020003
3	2	SCREW/T3.0x5mm	22-121-30005011

EXPLODED DIAGRAMS FOR Peripheral Devices
Vertical i-Button Kit
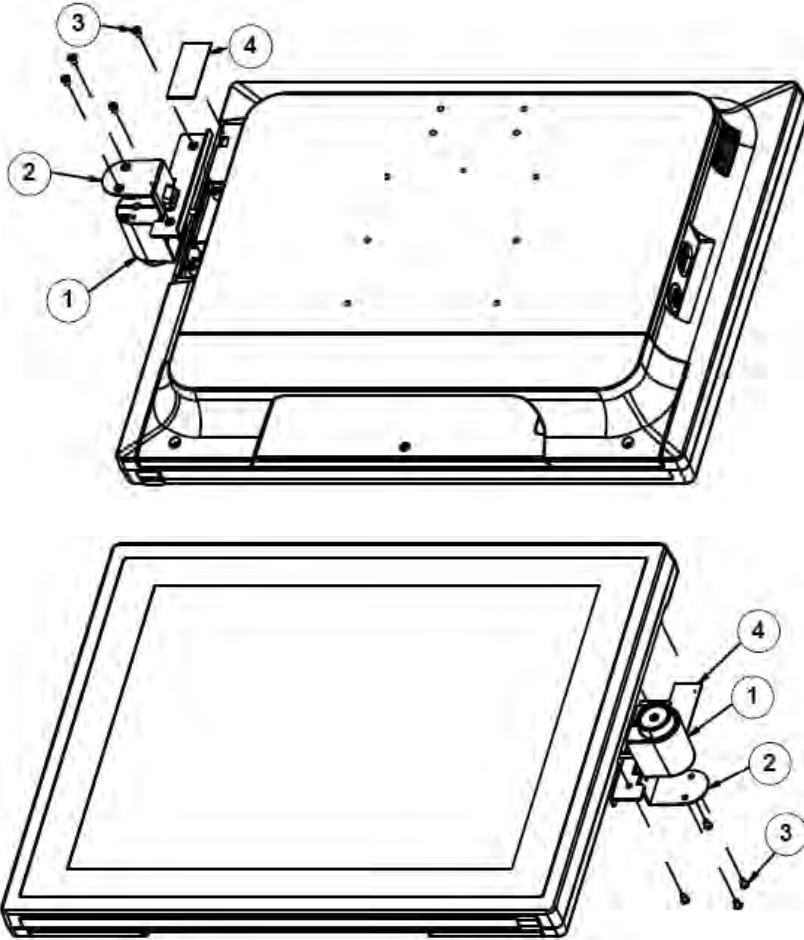
No.	Name	P/N No.	Q'ty
I	I BUTTON MODULE	--	I
2	I BUTTON PLATE	20-005-03062368	I
3	SCREW M3xL5	22-215-30005011	4
4	MYLAR	30-056-02300368	I

Vertical Fingerprint Only Kit
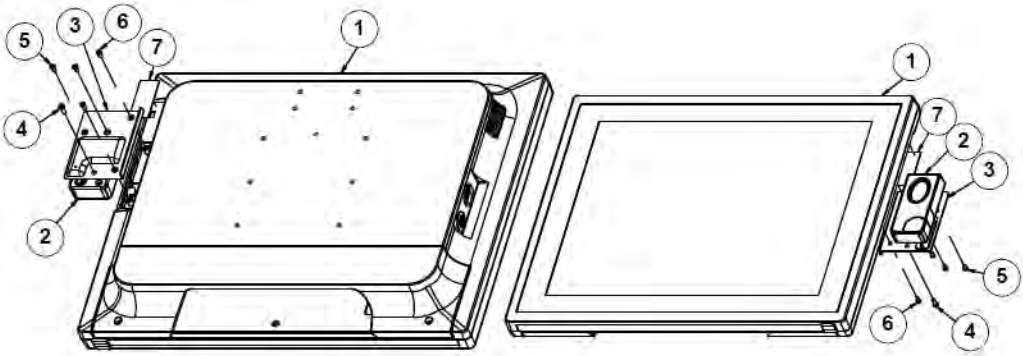
No.	Name	P/N No.	Q'ty
1	PA-6322 PPC	--	1
2	FINGER PRINTER MODULE	--	1
3	FINGER PRINTER HOLDER	20-006-03062368	1
4	TAPPING 3xL8	22-122-30080011	1
5	SCREW M3xL5	22-215-30005111	2
6	SCREW M3xL6	22-215-30006111	2
7	MYLAR	30-056-02300368	1

Fingerprint
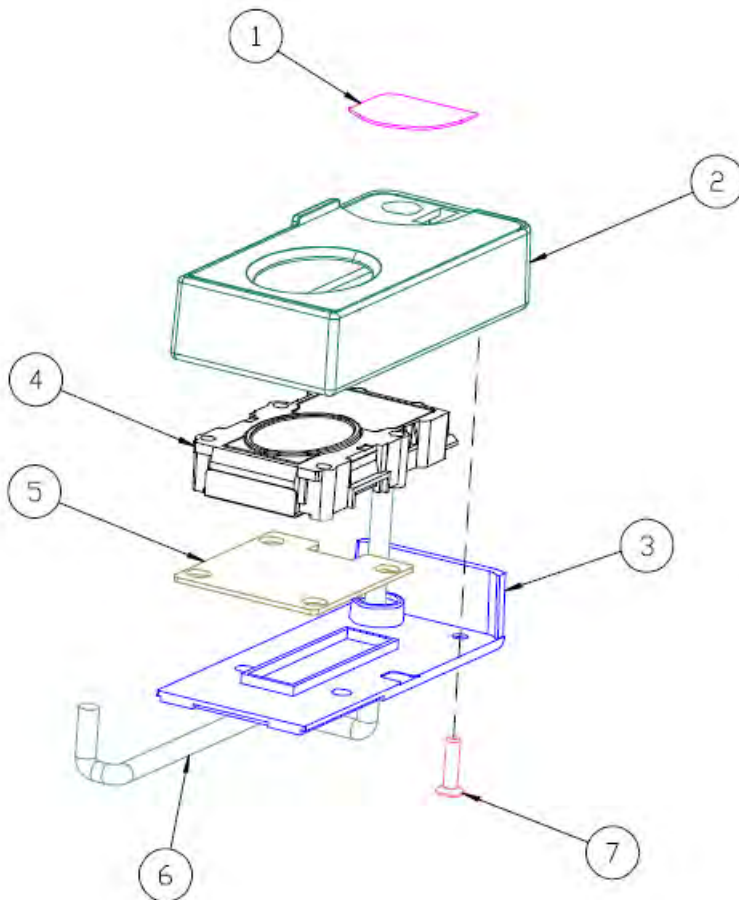
NO.	COMPONENT NAME	PART NO.	Q'TY
1	PC_SHEET	N/A	1
2	FINGER PRINTER TOP COVER	30-002-12720210	1
3	FINGER PRINTER BTM COVER	30-002-12820210	1
4	FINGER PRINTER MODULE	52-551-00501205	1
5	FINGER PRINTER BRACKET	N/A	1
6	FINGER PRINTER CABLE	N/A	1
7	FLAT HEAD SCREW	22-712-30010011	1

Vertical MSR & Fingerprint Kit
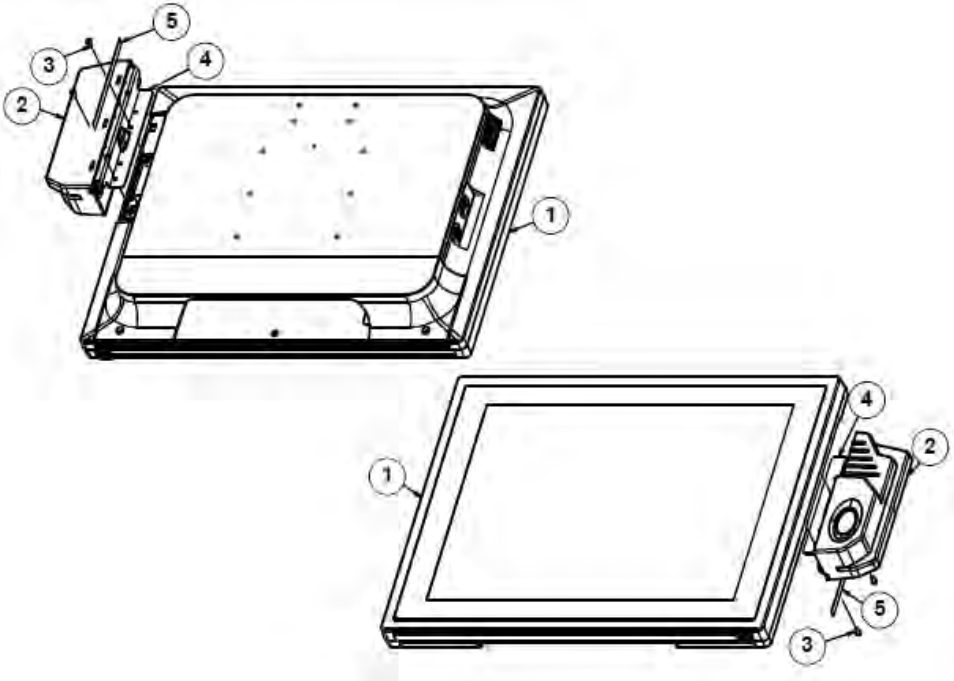
No.	Name	P/N No.	Q'ty
1	PA-6322 PPC	--	1
2	MSR-FINGER-PRINT-MODULE	--	1
3	SCREW M3xL6	82-275-30006018	2
4	MSR BRACKET	20-001-03061368	1
5	MYLAR	30-056-02200368	1

MSR
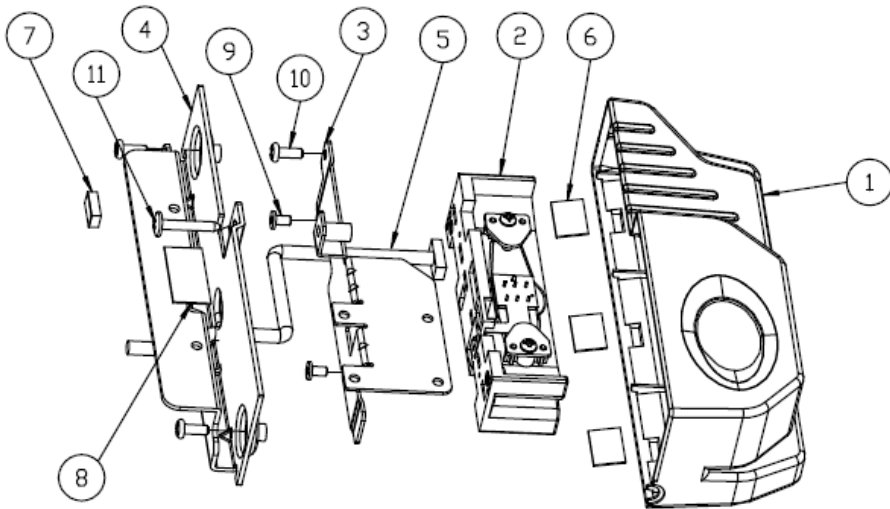
BOM: PA-6322 MSR_module_assy			
Item	Qty	Part Name	Part No.
1	1	MSR MAIN HOUSING(CLOSE)	90-014-28110181
2	1	PS2 ID TECH MSR	52-151-08333416
3	1	MSR_BRACKET	20-006-03001314
4	1	PA-6322 MSR BRACKET	20-001-03061368
5	1	MSR Cable	27-014-27402072
6	3	MSR HOUSING PORON	90-013-24100314
7	1	MSR BRACKET EVA-3	90-013-15400314
8	0.00015	PLASTIC TAPE	34-008-02002000
9	2	FILLISTR HEAD SCREW	22-272-30049015
10	3	ROUND HEAD SCREW	22-135-30008311
11	1	ROUND HEAD SCREW	22-835-30019011

MSR + Fingerprint
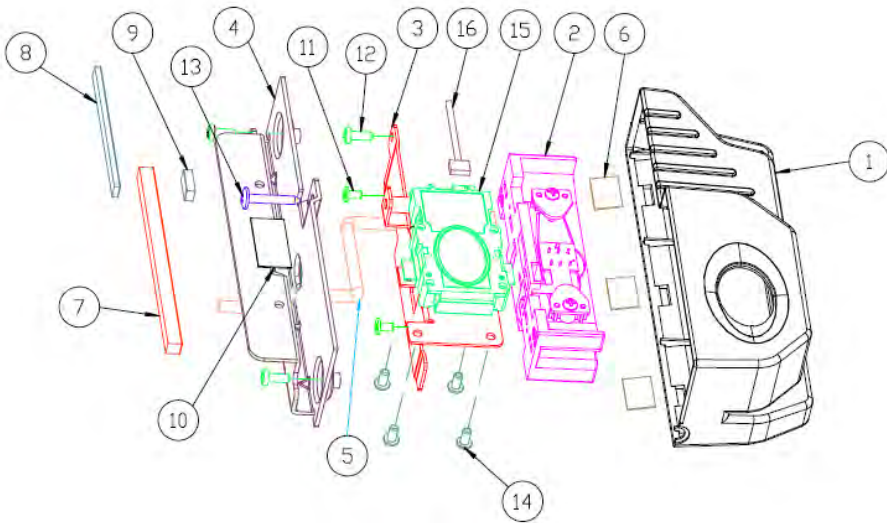
Item	Qty	Part Name	Part No.
1	1	FINGERPRINTER HOUSING(Open)	90-014-28310181
2	1	PS2 ID TECH MSR	52-151-08333416
3	1	MSR_BRACKET	20-006-03001314
4	1	PA-6322 MSR BRACKET	20-001-03061368
5	1	MSR Cable	27-014-27402072
6	3	MSR HOUSING PORON	90-013-24100314
7	1	MSR BRACKET EVA-1	90-013-15400353
8	1	MSR BRACKET EVA-2	90-013-15200314
9	1	MSR BRACKET EVA-3	90-013-15400314
10	0.00015	PLASTIC TAPE	34-008-02002000
11	2	FILLISTR HEAD SCREW	22-272-30049015
12	3	ROUND HEAD SCREW	22-135-30008311
13	1	ROUND HEAD SCREW	22-835-30019011
14	4	PAN HEAD SCREW	22-132-30060011
15	1	USB FINGERPRINTER	52-551-00501205
16	1	FINGERPRINTER CABLE	27-004-31404112

Vertical RFID, MSR, SMART Card Reader Kit
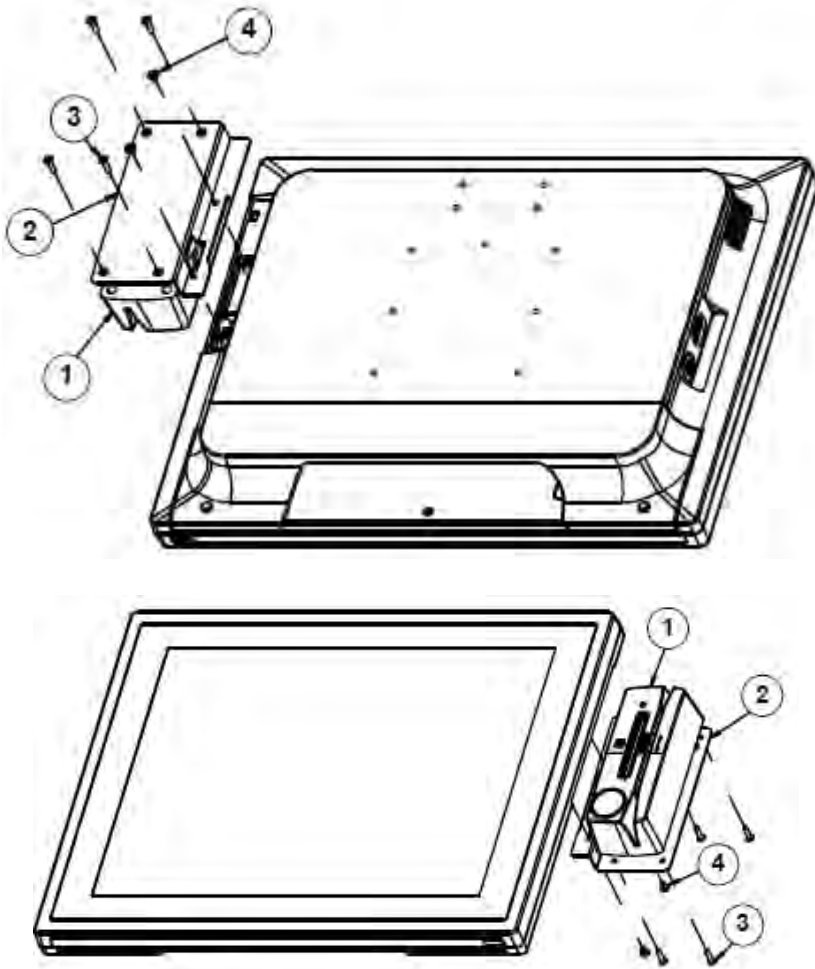
No.	Name	P/N No.	Q'ty
1	Vertical RFID+MSR MODULE	--	1
2	RFID BRACKET	20-006-03062368	1
3	SCREW M3xL12	22-215-30012011	4
4	SCREW M3xL5	22-242-30005311	2

Vertical MSR & i-Button Kit
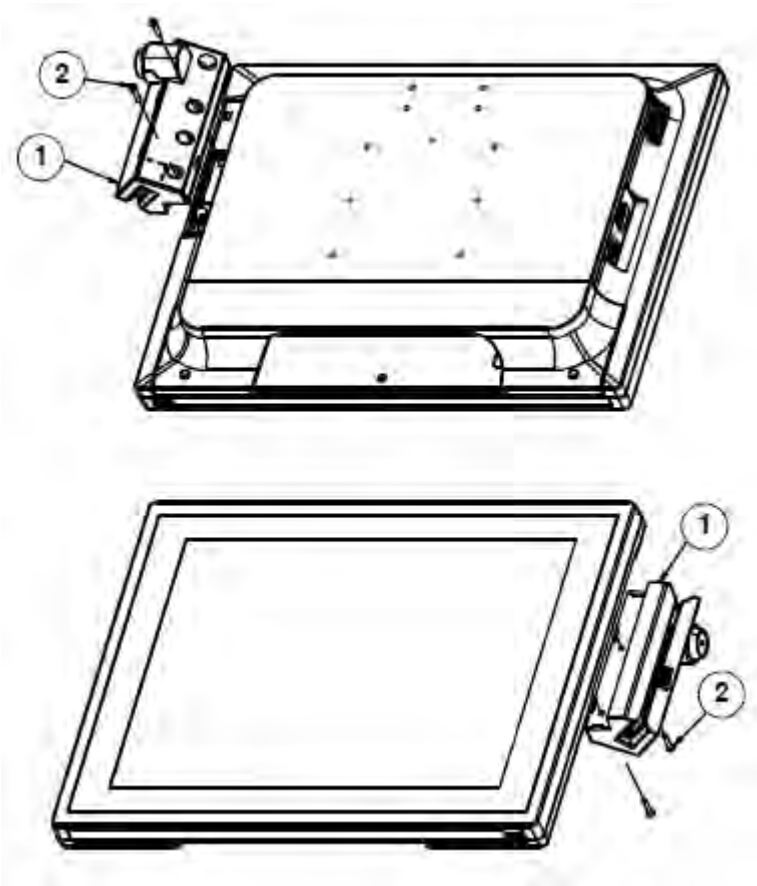
No.	Name	P/N No.	Q'ty
1	MSR MODULE	--	1
2	SCREW M3xL14	22-232-30014011	2

MSR & i-Button / Single Head
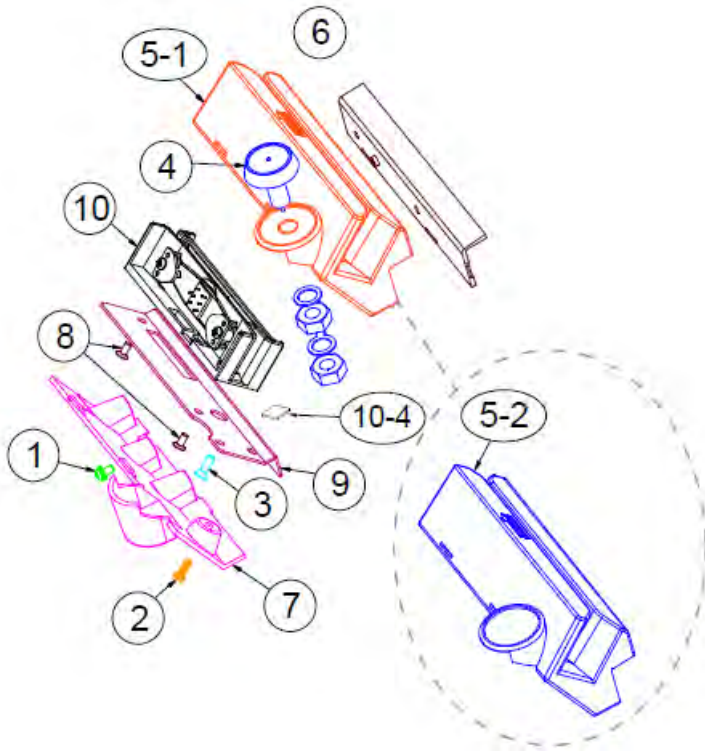
Item	Part Name		Part No.	Q'ty
1	ROUND HEAD WITH SPRING WASHER SCREW M3x0.5Px6mm		22-232-30060211	1
2	PAN HEAD SCREW T3.0x8mm (Black)		22-122-30080011	1
3	FLAT HEAD SCREW T3.0x10mm		22-712-30010011	1
4	iBUTTON (IBT100)		52-551-00100002	1
5	5-1 MSR TOP HOUSING-1		30-014-12310210	1
	5-2 MSR TOP HOUSING-2		30-014-12110210	1
6	MSR COVER SIDE HOUSING		30-002-12122210	1
7	MSR BOTTOM HOUSING		30-002-12020210	1
8	FLAT HEAD SCREW M3x0.5Px6mm (Black)		22-215-30060011	2
9	MSR FIX BRACKET		20-006-03006210	1
10	10-1 MSR_PROTECH_PS2		MB-3012RA-12N	1
		MSR CABLE	27-014-31402071	1
		IBUTTON CABLE	27-022-16503071	1
	10-2 MSR_ID TECH_PS2		52-151-08333416	--
		MSR CABLE	27-014-27402072	--
		MYLAR SHEET FOR MSR(10-4)	30-056-02100336	
	10-3 MSR_SYSKING_PS2		52-551-00883000	--
		MSR CABLE	27-014-21007111	--
		IBUTTON CABLE	27-022-16503071	--

MSR & i-Button / Twin Head
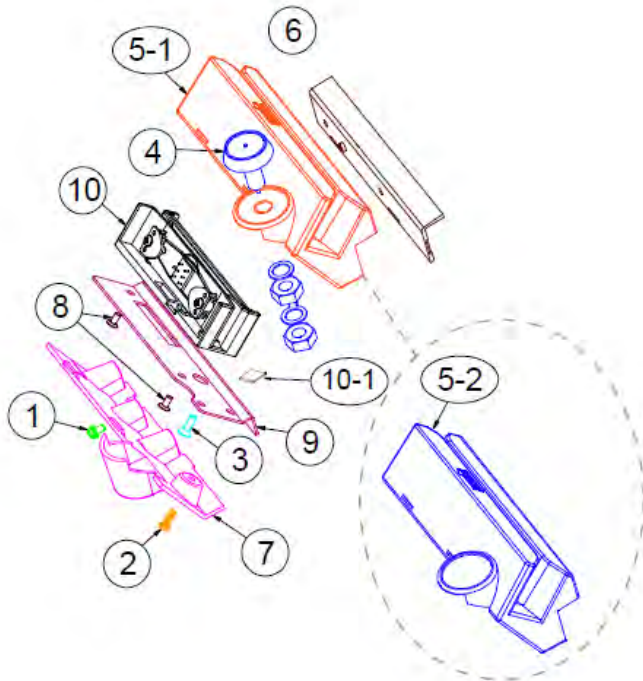
| Item	PN	Q'ty	Description
1	22-232-30060211	1	ROUND HEAD WITH SPRING WASHER SCREW M3x0.5Px6mm
2	22-122-30080011	1	PAN HEAD SCREW T3.0x8mm(Black)
3	22-712-30010011	1	FLAT HEAD SCREW T3.0x10mm
4	52-551-00100002	1	I Button Reader Sysking IBT100
5-1	30-014-12510210	1	MSR TOP HOUSING(I-BUTTON)-1(Black)
5-2	30-014-12110210	1	MSR TOP HOUSING(CLOSE)-1(Black)
6	30-002-12122210	1	POD-3520 MSR COVER SIDE-1(Black)
7	30-002-12020210	1	POD-3520 MSR BTM COVER-1(Black)
8	22-215-30060011	2	FLAT HEAD SCREW M3x0.5Px6mm(Black)
9	20-006-03006210	1	PA-3151 MSR FIXER BRACKET
10	52-551-00243100	1	Twin Head MSR,RS-232, GIGA-TMS MJR243R-10(F/W V1.01)
10	XX-XXX-XXXXXXXX	1	MSR for M/B cable (PB-6722 COM4_1)
	XX-XXX-XXXXXXXX	1	MSR for to itself cable
	XX-XXX-XXXXXXXX	1	IBUTTON for M/B cable (PB-6722 I-BUT)
	XX-XXX-XXXXXXXX	1	IBUTTON for itself cable
10-1	30-056-02100336	1	PA-6225 MYLAR SHEET FOR MSR

Second Display
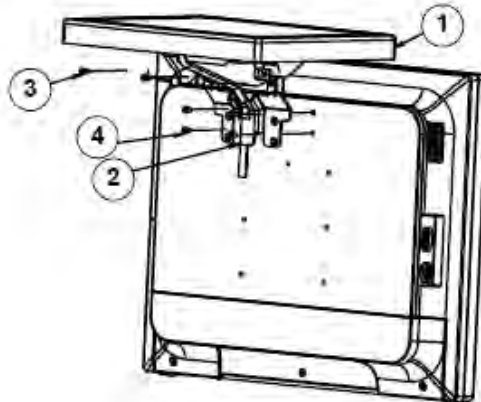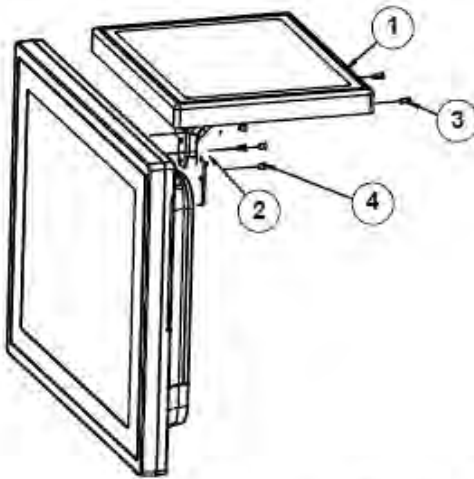
No.	Name	P/N No.	Q'ty
1	10.4" LCD Monitor	--	1
2	2ND-DIS-BRACKET	20-006-03061368	1
3	SCREW M4xL8	22-245-40008011	2
4	SCREW M4xL6	22-215-40006011	4

## EXPLODED DIAGRAMS FOR Packing

Panel PC System with Packing
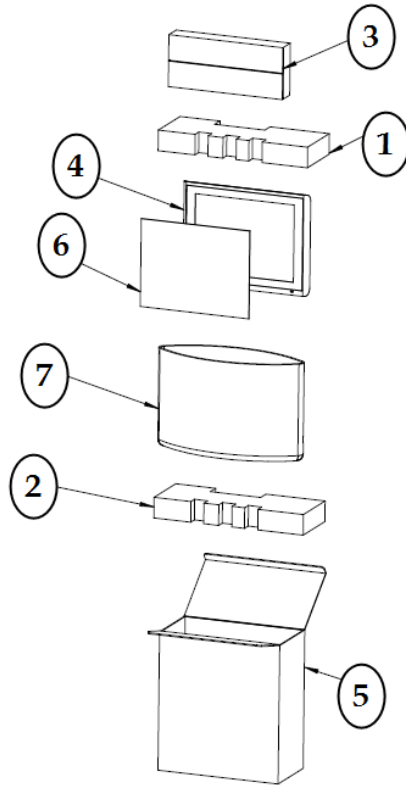
NO.	COMPONENT NAME	PART NO.	Q'TY
1	EPE TOP	94-016-00301368	1
2	EPE BOTTOM	94-016-00302368	1
3	ACCESSORIES BOX	34-003-01301086	1
4	PA-6322 PPC	------------	1
5	OUTER CARTON(PPC TYPE)	94-001-01401353	1
6	MYLAR	30-056-02100008	1
7	PE BAG	32-100-20010000	1

Easy Stand System with Packing
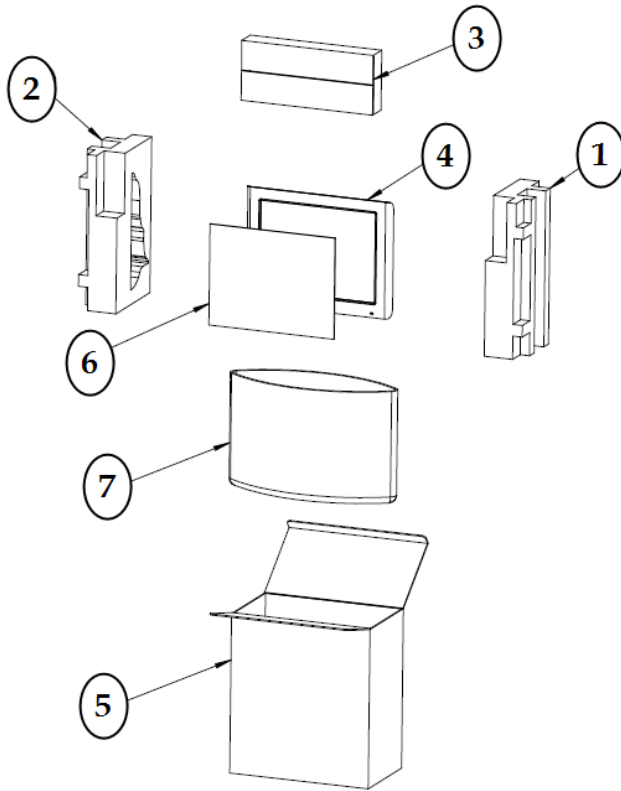
NO.	COMPONENT NAME	PART NO.	Q'TY
1	EPE RIGHT	94-016-00303368	1
2	EPE LEFT	94-016-00304368	1
3	ACCESSORIES BOX	34-003-01301086	1
4	PA-6322 model	------------	1
5	OUTER CARTON(PPC TYPE)	94-001-01404353	1
6	MYLAR	30-056-02100008	1
7	PE BAG	32-100-20010000	1

Normal Stand System with Packing
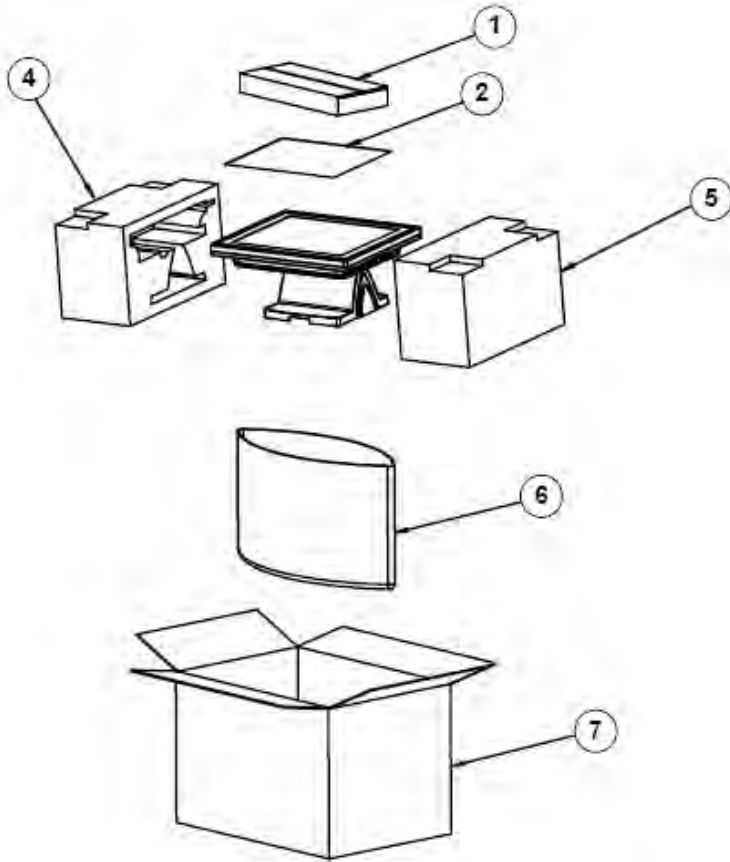
No.	Name	P/N No.	Q'ty
1	PS-650X CARTON BOXES	34-003-01301086	1
2	15 IN PANEL MYLAR	90-056-25300000	1
3	PA-6722_model	--------------	1
4	PA-6322 EPE LEFT	94-016-00305368	1
5	PA-6322 EPE RIGHT	94-016-00306368	1
6	PE BAG(850x670x0.07mm)	34-010-00210003	1
7	PA-6322 OUTER CARTON	94-001-01403353	1

Big Stand System with Packing
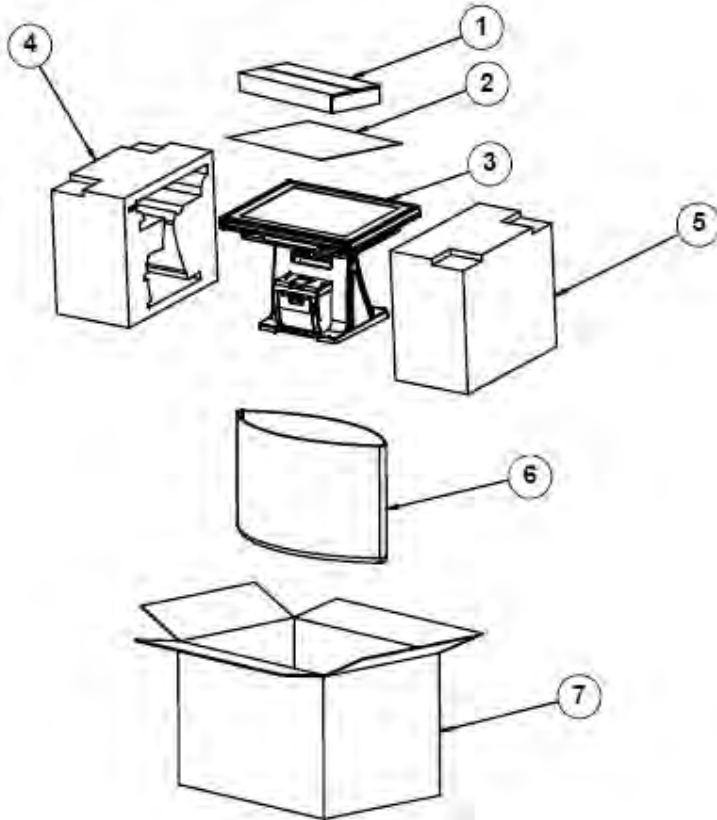
No.	Name	P/N No.	Q'ty
1	PS-650X CARTON BOXES	34-003-01301086	1
2	15 IN PANEL MYLAR	90-056-25300000	1
3	PA-6322_model	--------------	1
4	PA-6322 EPE LEFT	94-016-00308368	1
5	PA-6322 EPE RIGHT	94-016-00307368	1
6	PE BAG(850x670x0.07mm)	34-010-00210003	1
7	PA-6322 OUTER CARTON	94-001-01403353	1

EXPLODED DIAGRAMS FOR Spare Parts

Easy Stand Spare Parts
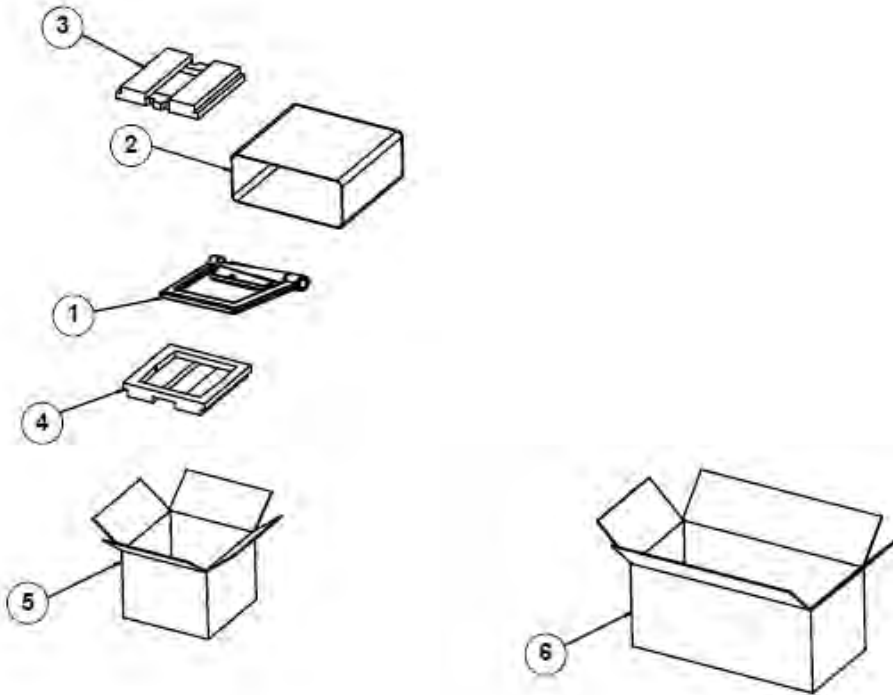
No.	Name	P/N No.	Q'ty
1	Easy Stand service pack	N/A	1
2	Package bag 480x460mm	32-100-20010000	1
3	EPE top		1
4	EPE bottom		1
5	Inner carton		1
6	Outer carton		0.5

Normal Stand Spare Parts
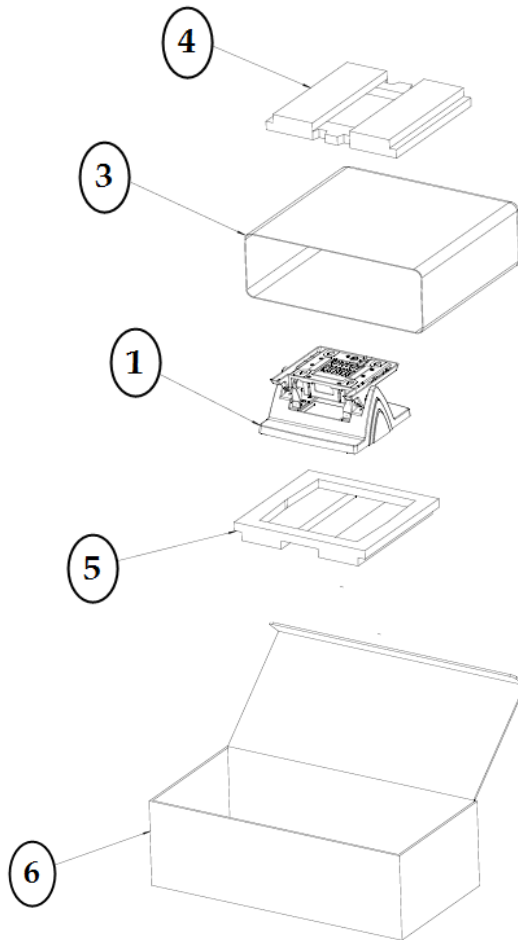
NO	Part Description	Part No.	Qty
1	Normal Stand	N/A	2
2	Silica gel	34-005-00010007	2
3	Package bag 480x460mm	32-100-20010000	2
4	EPE top 280x273x42mm	94-016-00303269	2
5	EPE bottom 280x273x42mm	94-016-00304269	2
6	Outer carton 592x308x229mm	94-001-01403269	1

Print Stand Spare Parts
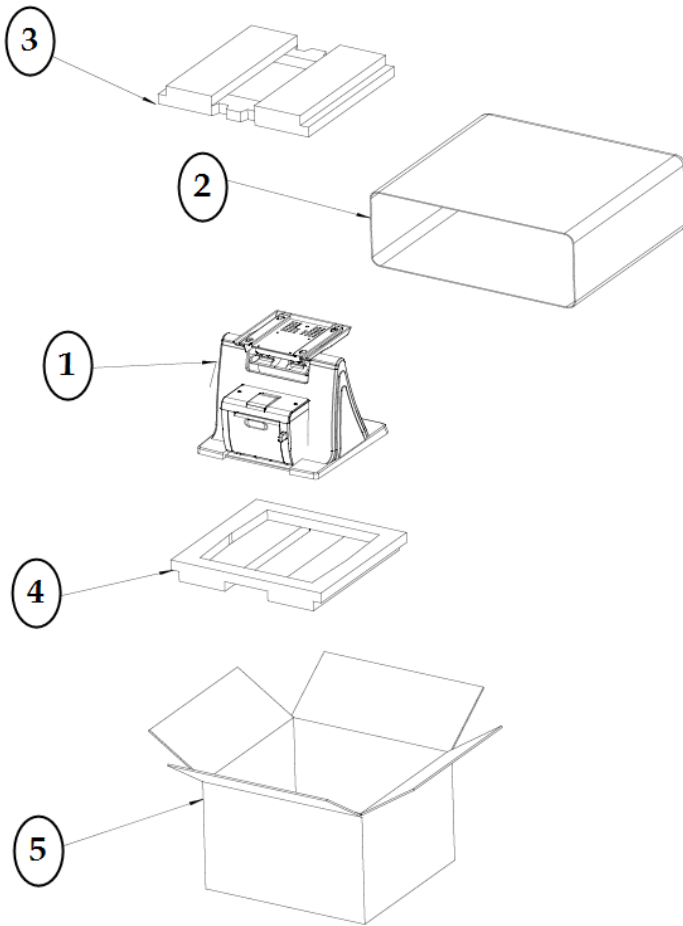
NO	Part Description	Part No.	Qty
1	Print Stand	N/A	1
2	Package bag 480x460mm	32-100-20010000	1
3	EPE top	94-016-00309353	1
4	EPE bottom	94-016-00310353	1
5	Carton	94-001-01405353	1