USER MANUAL

PA-J670

15" Fanless Slim POS Terminal

PA-J670 M2

PA-J670 POS System

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

1 Introduction 1-1

1.1 About This Manual 1-2

1.2 POS System Diagrams 1-3

1.2.1 Panel PC 1-3

1.2.2 Easy Stand 1-4

1.2.3 Small Stand 1-5

1.2.4 PRINTER Stand 1-6

1.3 System Specifications 1-8

1.4 Safety Precautions 1-13

2 System Configuration 2-1

2.1 System External I/O Ports Diagram & Pin Assignment 2-2

2.2 Main Board Component Location & Jumper Settings 2-3

2.2.1 Top View of System Main Board 2-3

2.2.2 Bottom View of System Main Board 2-5

2.3 Setting Jumpers 2-6

2.4 Setting Main Board Connectors and Jumpers 2-8

2.5 Function Buttons and I/O Ports 2-10

2.5.1 Power Button 2-10

2.5.2 DC-IN Port (DC-IN) 2-10

2.5.3 VGA Port (VGA) 2-10

2.5.4 COM Port (COM1, COM2, COM3, COM4 (optional) 2-11

2.5.5 Dual USB 2.0 Ports (USB3, USB4, USB5) 2-11

2.5.6 Dual USB 3.0 Ports (USB1, USB2) 2-12

2.5.7 LAN Port (LAN) 2-12
2.5.8 Printer Power Port (PRINT PWR) (optional) 2-13
2.5.9 Cash Drawer Port (DRW1) 2-13
2.5.10 2nd Display Power Port (2nd DIS PWR) (optional) 2-13
2.5.11 HDMI Port Connector (HDMI) 2-14
2.5.12 Power USB Connector (PWR USB) (optional) 2-15

2.6 Setting Main Board Connectors and Jumpers 2-16
2.6.1 COM Port Voltage Selection 2-16
2.6.2 COM Connectors (COM1_1, COM2_1, COM4) 2-16
2.6.3 VGA Connector (JVGA1) 2-17
2.6.4 PWM & BKLTCTL Signal Selection (JP4) 2-18
2.6.5 PWM Voltage Selection (JP5) 2-19
2.6.6 COM4 & i-Button Function Selection (JP6, JP7, JP8) 2-20
2.6.7 Cash Drawer Control Selection (JP11) 2-21
2.6.8 Slide Switch for Panel Resolution Selection (SW1) 2-24
2.6.9 USB 2.0 Connector (USB3_2) 2-24
2.6.10 USB 2.0 Connectors (USB2, USB5, USB6, JUSB7) 2-25
2.6.11 Touch Panel Connector (TOUCH1) 2-26
2.6.12 HD Audio Connector (JAUD1) 2-27
2.6.13 Embedded Display Port (EDP) Connector (EDP1) 2-28
2.6.14 LVDS Inverter Connector (JINV1) 2-29
2.6.15 i-Button Connector (I-BUT) 2-29
2.6.16 M.2 Wi-Fi Express Slot (M2_E) 2-30
2.6.17 M.2 SSD Express Slot (M2_M) 2-31
2.6.18 SATA 3.0 & SATA Power Connectors (SATA1, SATA_PWR1) 2-32
2.6.19 LPC Connector (JLPC1) 2-33
2.6.20 Fan Connector (FAN_1) 2-33
2.6.21 Power Output Connectors (OUT12V_1, OUT12V_2,

OUT_24V) 2-34
2.6.22 RTC Connector (BAT1) 2-35
2.6.23 Speaker Connector (JSPK1) 2-35
2.6.24 Switch LED Connectors (SW2, LED1) 2-36
2.6.25 USB2 Port Selection (JP_USB2) 2-37
2.6.26 USB3 Port Selection (JP_USB3_1, JP_USB3_2) 2-38
2.6.27 USB5 Port Selection (JP_USB5) 2-39
2.6.28 Force DNX Firmware Load Selection (JP1) 2-40
2.6.29 Flash Descriptor Override Selection (JP1) 2-40
2.6.30 EDP (Embedded Display Port) Voltage Selection (JP_VDD1) 2-41
2.6.31 Clear CMOS Data Selection (JP3) 2-42
2.6.32 Cash Drawer Control Selection 2-43
2.7 Printer Board Component Locations & Pin Assignment 2-44
2.7.1 Printer Board: PDAC-3100 2-44
2.7.2 Jumper & Connector Quick Reference Table 2-45
2.7.3 Setting Printer Board Connectors and Jumpers: PDAC-3100 2-46
2.7.3.1 Power Supply Connector 2-46
2.7.3.2 RS-232 Interface Connector 2-46
2.7.3.3 Auto-Cutter Connector 2-47
2.7.3.4 USB Connector 2-47
2.7.3.5 Thermal Head/Motor/Sensor Connector 2-48
2.7.3.6 Terminal Assignment Connector 2-50
2.7.4 Printer Board: MB-1030 series 2-51
2.7.4.1 Jumper & Connector Quick Reference Table 2-52
2.7.5 Setting Printer Board Connectors and Jumpers : MB-3010 2-53
2.7.5.1 Power Supply Connector 2-53

2.7.5.2 RS-232 Interface Connector 2-53
2.7.5.3 Thermal Head/Motor/Sensor Connector 2-54
2.7.5.4 Auto-Cutter Connector 2-56
2.7.5.5 Paper-Near-END Sensor Connector 2-56
2.7.5.6 USB Interface Connector 2-57
2.7.5.7 Terminal Assignment Connector 2-57
2.7.6 Printer Board: MB-1011 & MB-1013 2-58
2.7.6.1 Jumper & Connector Quick Reference Table 2-59
2.7.7 Setting Printer Board Connectors and Jumpers: MB-1011 & MB-1013 2-60
2.7.7.1 Power Supply Connector 2-60
2.7.7.2 RS-232 Interface Connector 2-60
2.7.7.3 Auto-Cutter Connector 2-61
2.7.7.4 Thermal Head/Motor/Sensor Connector 2-61
2.7.7.5 Terminal Assignment Connector 2-63
2.7.7.6 USB Interface Connector 2-63

2.8 VFD Board Component Locations & Pin Assignment 2-64
2.8.1 VFD Board: MB-4103, LD720 2-64
2.8.2 Jumper & Connector Quick Reference Table 2-65
2.8.3 Setting MB-4103 & LD720 VFD Board Connectors and Jumpers 2-66
2.8.3.1 Power Switch Selection 2-66
2.8.3.2 RS-232 Serial Interface Connector 2-67

2.9 MSR Board Component Locations & Pin Assignment 2-68
2.9.1 ID TECH 2-68
2.9.1.1 Main Connector 2-68
2.9.2 MB-3012 2-69
2.9.2.1 Information Button Reader 2-69
2.9.2.2 Output Connector 2-69

3 Software Utilities 3-1

3.1 Driver Disc 3-2

3.2 Intel® Chipset Software Installation Utility 3-4

3.3 Installing Graphics Driver Utility 3-5

3.4 LAN Driver Utility 3-6

3.5 Sound Driver Utility 3-7

3.6 Installing Intel® Trusted Execution Engine Installation Utility 3-8

3.7 Installing Intel® Serial I/O Driver Utility 3-9

3.8 Installing Microsoft Hotfix Driver Utility 3-10

3.9 Installing Intel® Processor Win10 IO Driver Utility 3-11

3.10 Peripheral Devices 3-12

3.10.1 Printer Board: MB-1030 3-12

3.10.1.1 Commands 3-12

3.11 API 3-58

3.11.1 API Package Content 3-58

3.11.2 API Procedure 3-59

3.11.3 Cash Drawer 3-62

3.11.4 Watchdog Timer 3-63

3.11.5 Hardware Monitor 3-64

3.11.6 I-Button 3-65

3.12 API Function 3-66

3.12.1 Cash Drawer Function 3-66

3.12.2 Watch Dog Function 3-67

3.12.3 Hardware Monitor Function 3-68

3.12.4 I-Button Function 3-70

4 BIOS SETUP 4-1

4.1 Introduction 4-2

4.2 Accessing Setup Utility 4-3

4.3 Main 4-5

4.4 Advanced 4-6

4.4.1 Trusted Computing 4-7

4.4.2 ACPI Settings 4-9

4.4.3 F81966 Super IO Configuration 4-10

4.4.3.1 Serial Port 1 Configuration 4-11

4.4.3.2 Serial Port 2 Configuration 4-12

4.4.3.3 Serial Port 3 Configuration 4-13

4.4.3.4 Serial Port 4 Configuration 4-14

4.4.4 Hardware Monitor 4-15

4.4.4.1 Hardware Monitor - Smart Fan Mode Configuration 4-16

4.4.5 F81966 Watchdog 4-18

4.4.6 S5 RTC Wake Setting 4-19

4.4.6.1 S5 RTC Wake Setting- Fixed Time 4-20

4.4.6.2 S5 RTC Wake Setting- Dynamic Time 4-21

4.4.7 CPU Configuration 4-22

4.4.7.1 CPU Configuration - Socket 0 CPU Information 4-23

4.4.7.2 CPU Configuration - CPU Power Management 4-24

4.4.8 Network Stack Configuration 4-25

4.4.9 USB Configuration 4-26

4.5 Chipset 4-27

4.5.1 North Bridge 4-28

4.5.2 South Cluster Configuration 4-29

4.5.2.1 South Cluster Configuration - HD-Audio Configuration 4-30

4.5.2.2 South Cluster Configuration - LPSS Configuration 4-31

4.5.2.3 South Cluster Configuration - PCI Express Configuration .. 4-33
4.5.2.4 South Cluster Configuration - SATA Drives 4-36
4.5.2.5 South Cluster Configuration - Miscellaneous Configuration 4-37
4.6 Security 4-38
4.7 Boot 4-39
4.8 Save & Exit 4-40

Appendix A System Diagrams A-1

Easy Maintenance - HDD A-2
Easy Maintenance - Memory A-4
Easy Maintenance - Mainboard A-7
Exploded Diagrams for Panel PC A-8
Exploded Diagrams for Stand A-22
Exploded Diagrams for Printer Module A-41
Exploded Diagrams for Peripheral Devices A-52
Exploded Diagrams for Packing A-66
Exploded Diagrams for Spare Parts A-70

Appendix B Technical Summary B-1

Interrupt Map B-2
I/O MAP B-17
Memory Map B-19
Configuring WatchDog Timer B-21
Flash BIOS Update B-23

1 Introduction

This chapter gives you the information for the PA-J670. 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-J670 Series System. The PA-J670 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-J670 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 component locations of motherboard, printer, VFD, MSR components and their functions. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 3 Software Utilities

This chapter contains detailed information for driver installations of the Intel® Utility, Graphics, LAN, Sound Codec, Intel® Trusted Execution Engine Installation Utility, Intel® Serial I/O Driver Utility, Microsoft Hotfix Driver Utility, Intel® Processor Win10 IO Driver Utility as well as embedded peripheral devices, and information of embedded peripheral devices and API.

Chapter 4 BIOS Setup

This chapter provides BIOS setup information.

Appendix A System Diagrams

This appendix provides the exploded diagrams and part numbers of PA-J670.

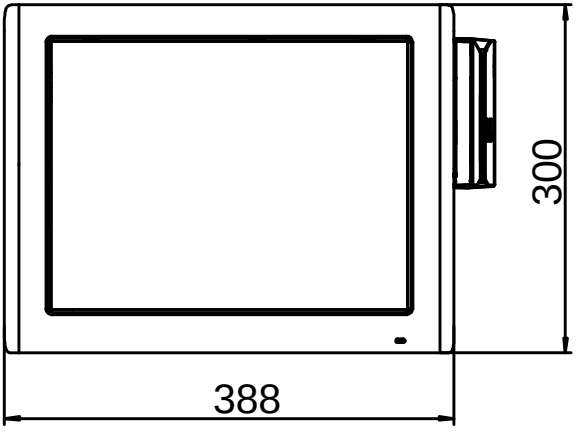
Appendix B Technical Summary

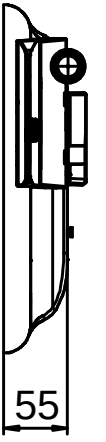
This appendix provides the information about the allocation maps for system resources, Watchdog Timer Configuration and Flash BIOS Update.

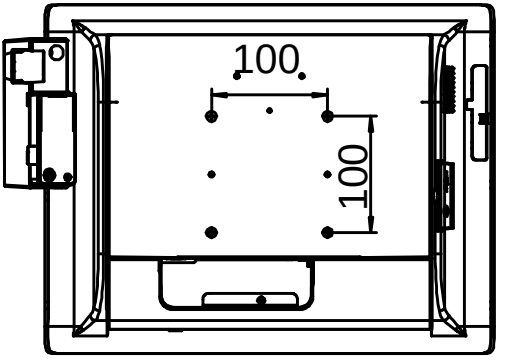
1.2 POS System Diagrams

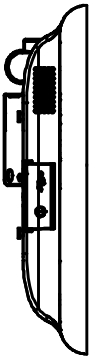
Unit: mm

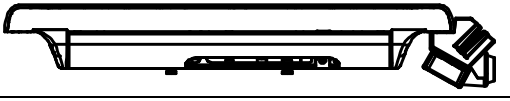
1.2.1 Panel PC



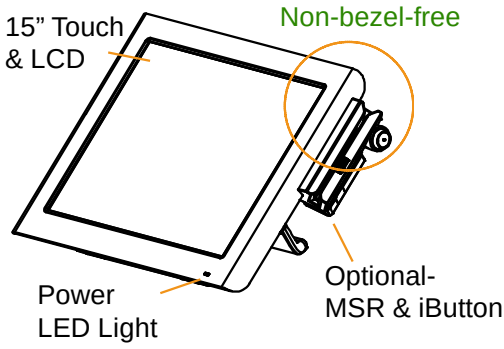


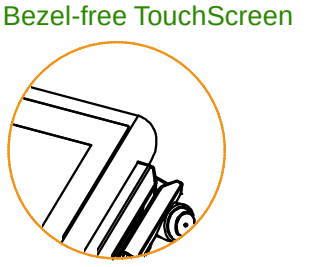


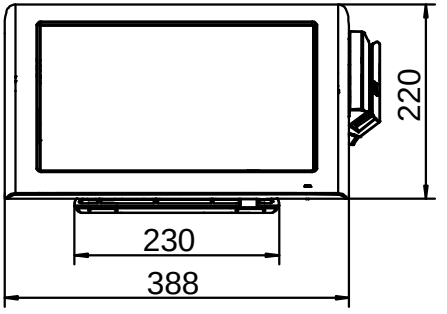


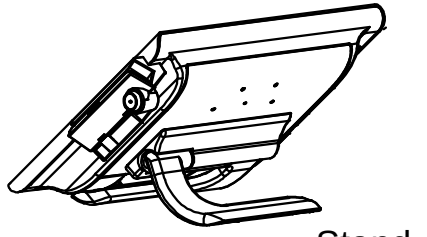


1.2.2 Easy Stand

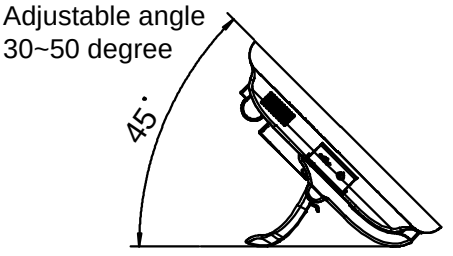


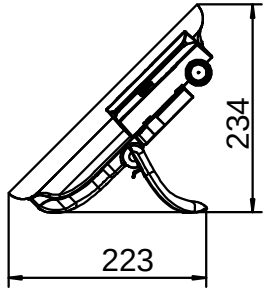




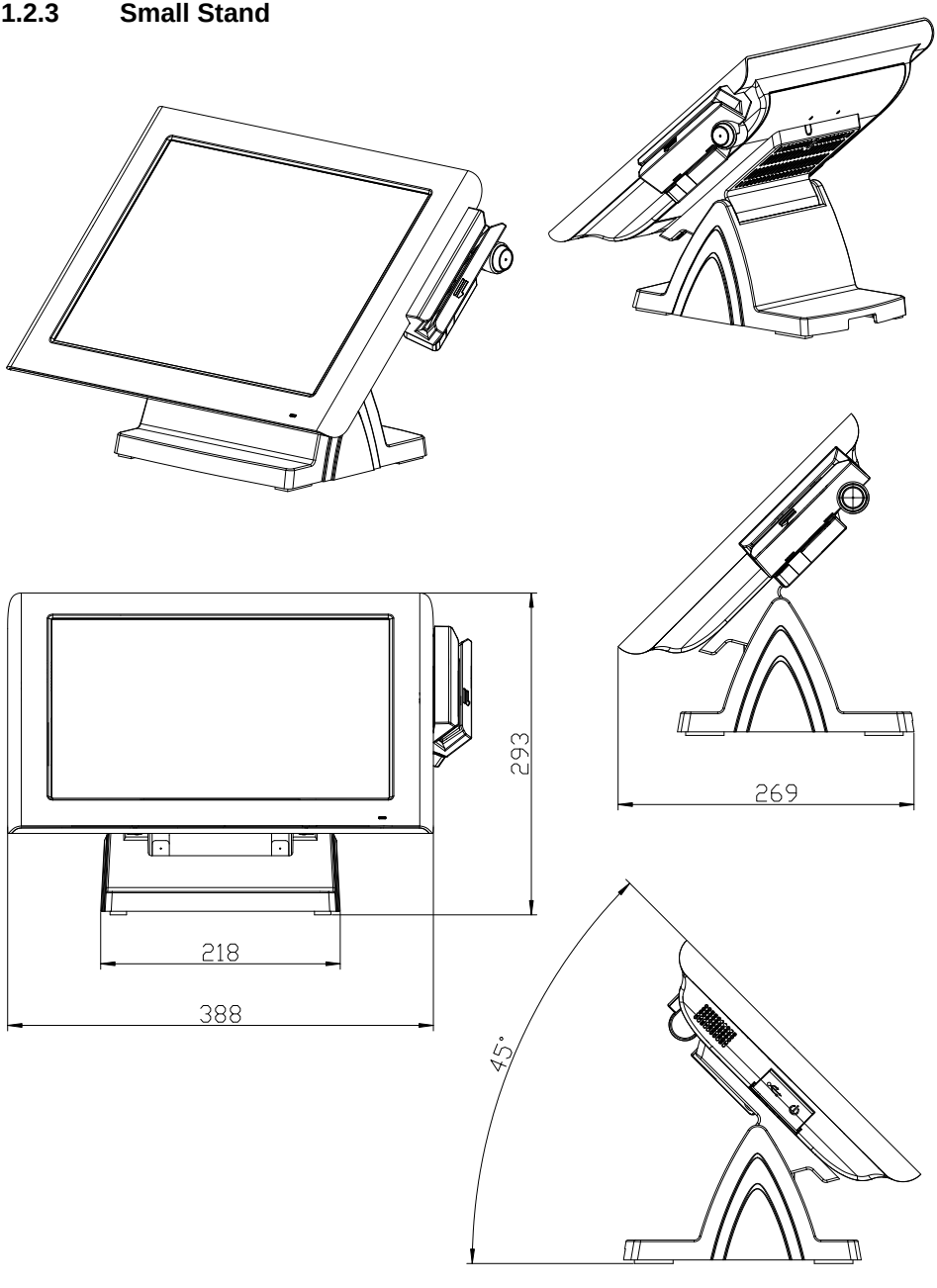


Stand



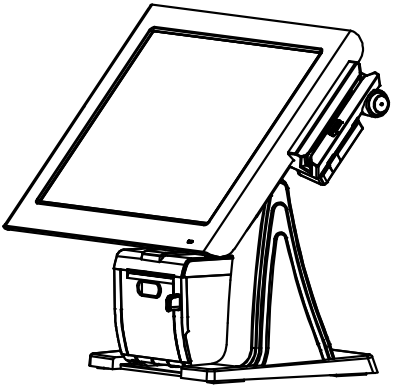


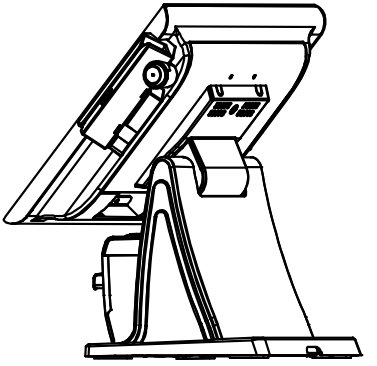
1.2.3 Small Stand

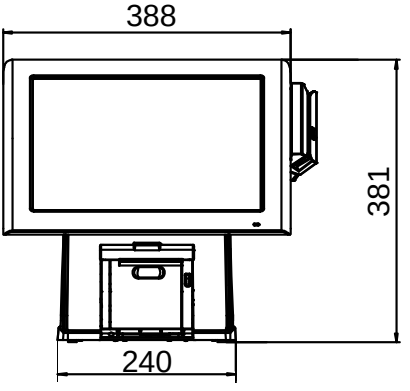


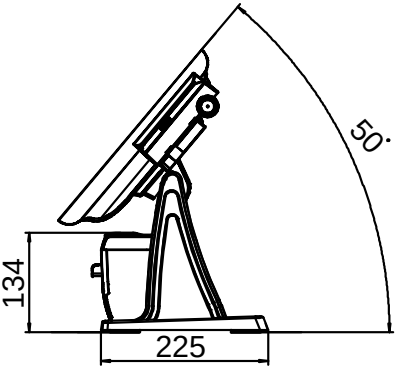
1.2.4 PRINTER Stand

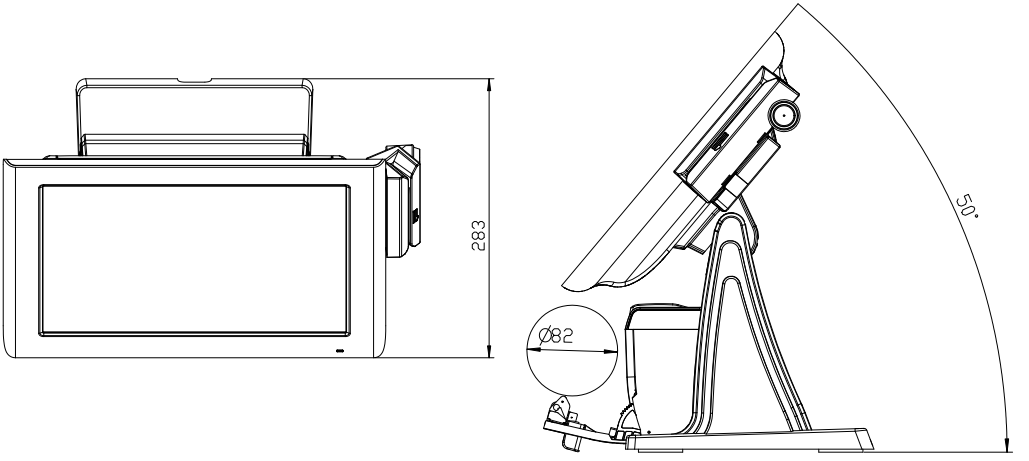
Unit: mm





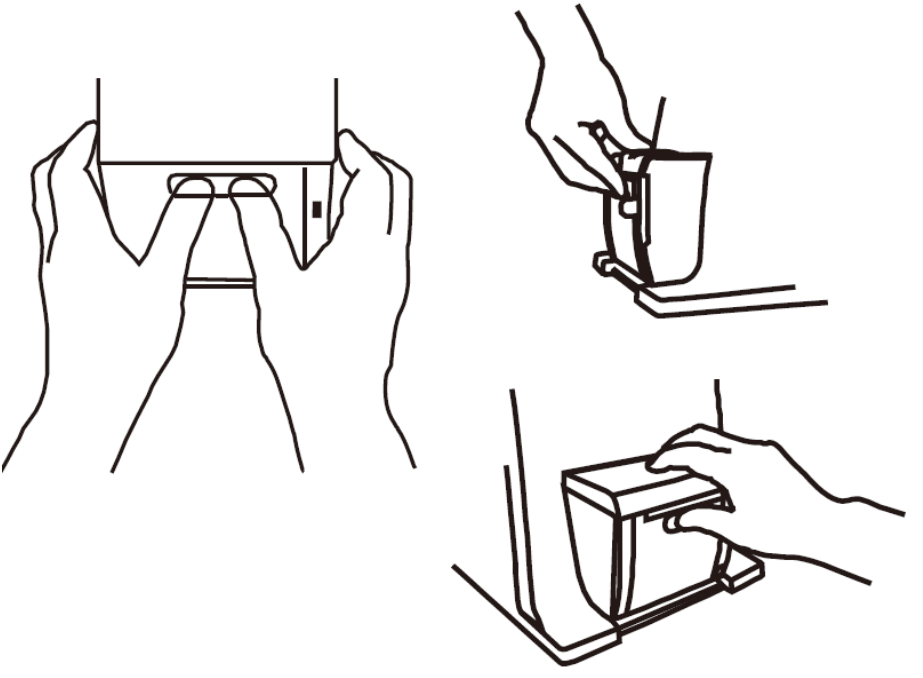






Caution:

Please refer to the picture below to close the printer door properly.



1.3 System Specifications

System

CPU	➢ Intel® Celeron® J3455 CPU
Memory	➢ 1 x DDR3L SO-DIMM (up to 8GB)
Network	➢ Gigabit 10/100/1000 Base-T Fast Ethernet
Audio	➢ 2W speaker
System Weight	➢ Easy stand with power adaptor approx. 6 kg (POS) ➢ 5 kg (PPC)
Dimensions (W x H x D)	➢ POS type: 388 x 234 x 223 mm (45 degree) ➢ PPC type: 388 x 300 x 93.2 mm (with power adaptor holder)
Viewing Angle	➢ Easy stand: 30~50 degree ➢ Normal stand: 0~70 degree ➢ Printer stand: 0~55 degree
Color	➢ Black
O.S. Support	➢ Win 10 IoT Ent 2019 LTSC / 2016 LTSB

Storage

SATA	➢ 1 x 2.5" HDD or SSD ➢ 1 x M.2 2242 (SATAIII interface)

I/O Ports

USB	➢ **Rear:** 2 x USB 2.0 / 2 x USB 3.0 ➢ **Side:** 1 x USB 2.0 (optional)
Serial Ports	➢ COM x 3+1, RJ50 connector ➢ COM1/2 support RI /+5V /+12V selectable under BIOS ➢ COM4 (optional, with cable)
LAN	➢ 1 x RJ45
VGA	➢ 1 x DB15
HDMI	➢ 1 x HDMI
Audio	➢ 1 x Mic In, 1 x Line Out
Cash Drawer	➢ 1 x RJ12 (+12V or +24V selectable)
HDD Slot	➢ 1 x HDD maintenance slot
DC In	➢ 1 x 4-pin DC power jack
DC Out	➢ 1x 12Vdc out (3-pin) for 2nd display (optional)

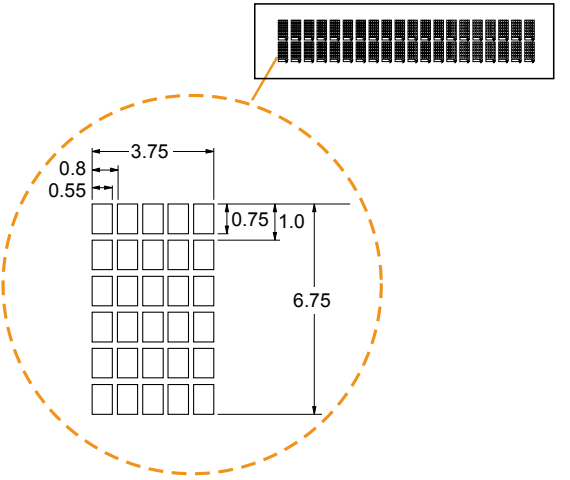
Display

LCD	➢ 15" TFT LCD
Max. Resolution	➢ 1024 x 768
Brightness	➢ 300 cd/m²
Touchscreen	➢ Bezel-free 5-wire analog resistive or projected capacitive

Environment

EMC & Safety	➢ CE / FCC
Temperature (with airflow)	➢ Operating: 0°C ~35°C (32°F ~ 95°F) ➢ Storage: -5°C ~60°C (-27°F ~ 140°F)
Humidity	➢ 20%~90%

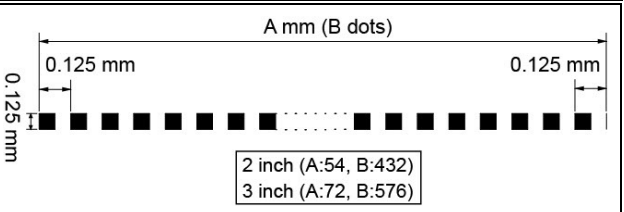
Optional Accessories

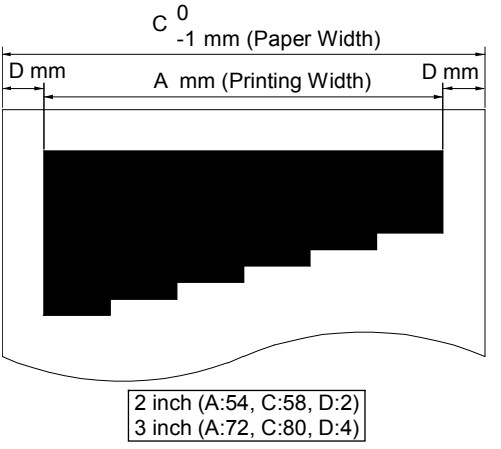
MSR & i-Button	➢ JIS I or II, ISO Track1+2+3
Printer	➢ 2" or 3" easy loading thermal printer with auto-cutter
Fingerprint	➢ 8-bit grayscale reader
2nd Display	➢ Hang on back: 8" or 10.4" or 15" LCD ➢ Standalone: 15" LCD
Customer Display	➢ Interface: RS-232C Baud Rate: 9600/19200 bps ➢ VFD Kit, Placement: 20 columns and 2 lines, each column is 5 x 7 dots 

<table>
<tr><td></td><td>
• 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
</td></tr>
<tr><td>Printer</td><td>
2” or 3” easy loading thermal printer with auto-cutter

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

Printer





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 m
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

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-J670 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   - Avoid installing your PA-J670 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-J670 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-J670 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

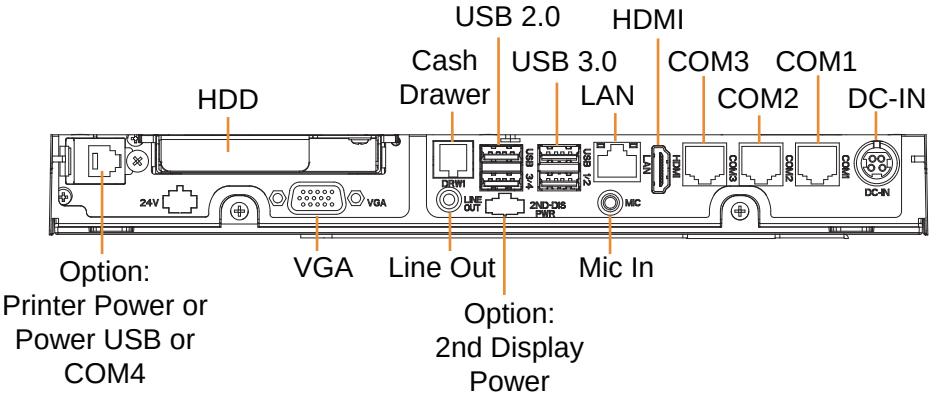
This chapter contains helpful information that describes the jumper and connector settings, component locations, and pin assignment.

The following topics are included:

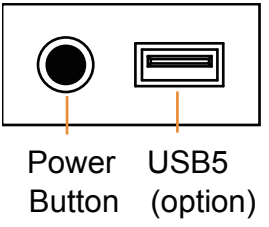
- External I/O Ports Diagram
- Main Board Component Locations
- How to Set Jumpers
- Setting Main Board Connectors and Jumpers
- Printer Board Component Locations & Pin Assignment
- Setting Printer Board Connectors and Jumpers
  - PDAC-3100
  - MB3010C
  - MB-1011 & MB-1013
- Setting VFD Board Connectors and Jumpers

2.1 System External I/O Ports Diagram & Pin Assignment

Rear I/O Ports



Side I/O



2.2 Main Board Component Location & Jumper Settings

2.2.1 Top View of System Main Board

M/B: PB-A900

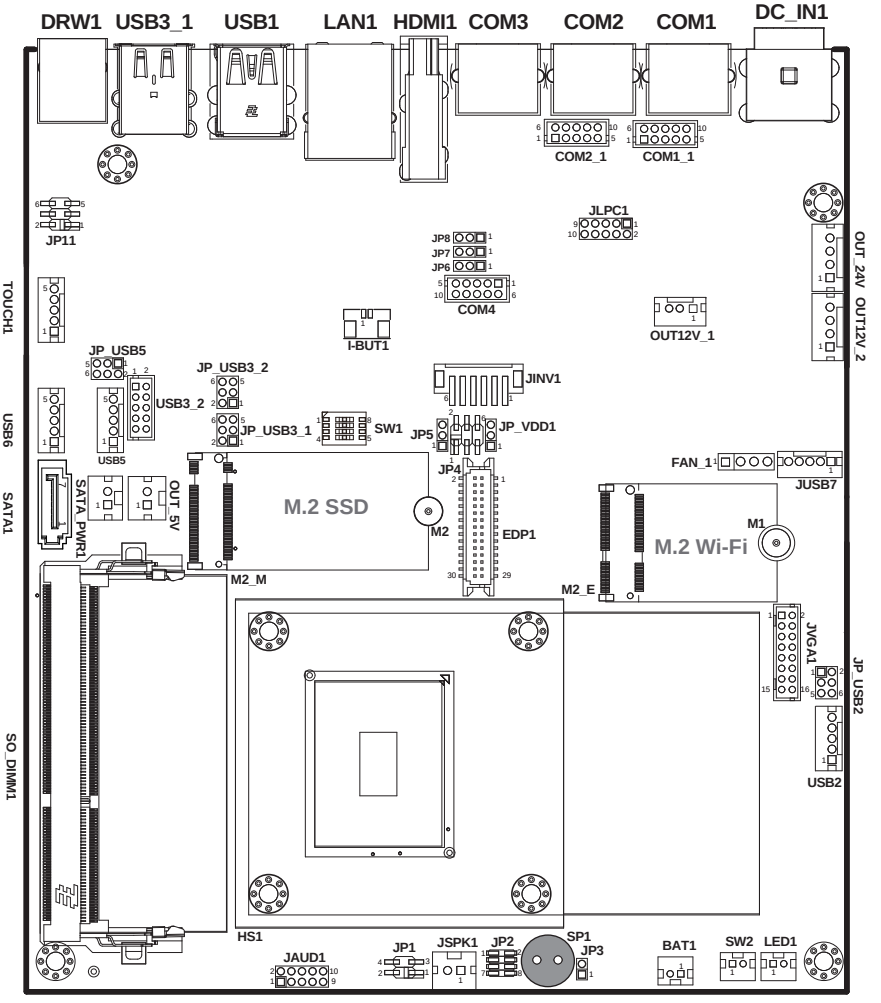
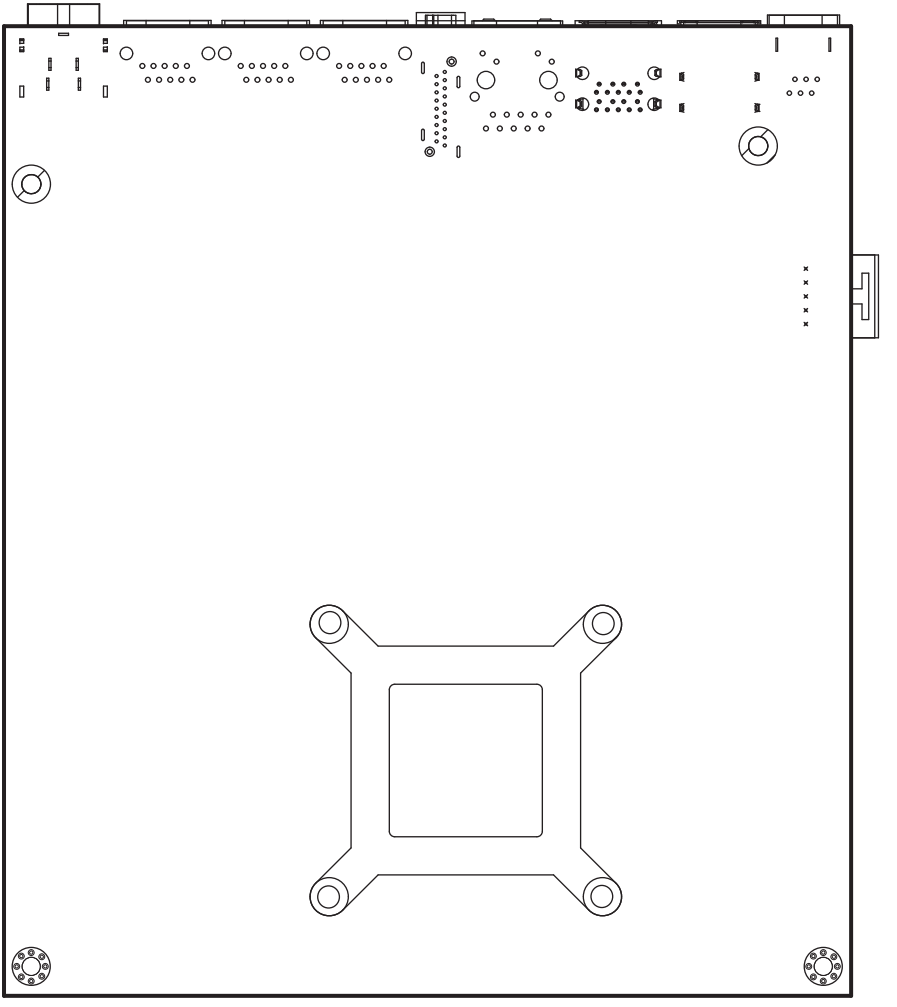


Figure 2-1. PB-A900 Main Board Component Location

	**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 PB-A900 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.

2.2.2 Bottom View of System Main Board

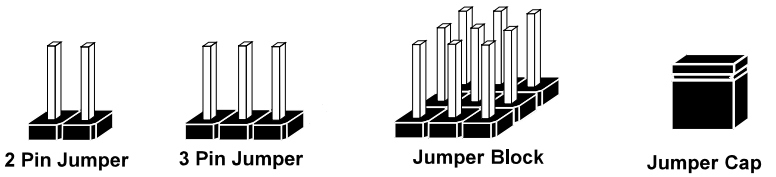


2.3 Setting Jumpers

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.

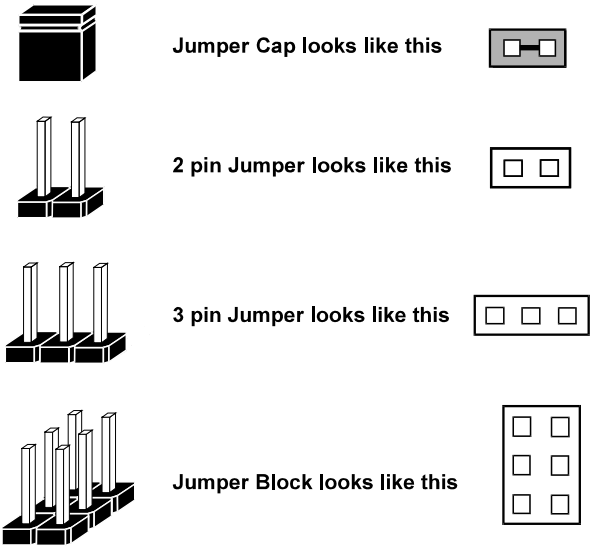
Jumpers can be combined into sets that are called jumper blocks. When jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows what this looks like.

Jumpers & Caps

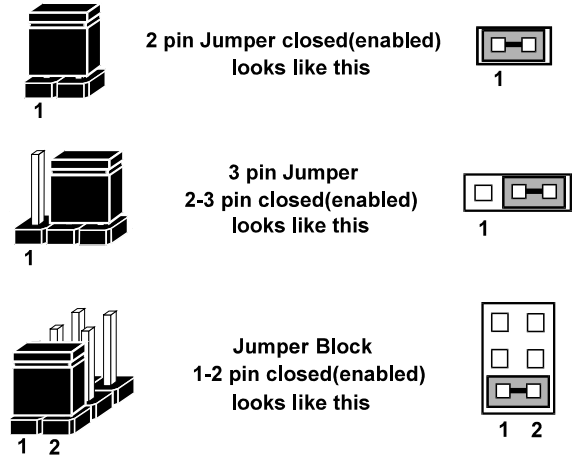


If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different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

Jumper Diagrams



Jumper Settings



2.4 Setting Main Board Connectors and Jumpers

JUMPER Description	NAME
USB2 Port Selection	JP_USB2
USB3 Port Selection	JP_USB3_1, JP_USB3_2
USB5 Port Selection	JP_USB5
EDP (Embedded Display Port) Voltage Selection	JP_VDD1
Force DNX Firmware Load Selection	JP1
Flash Descriptor Override Selection	JP1
Clear CMOS Data Selection	JP3
PWM & BKLTCTL Signal Selection	JP4
PWM Voltage Selection	JP5
COM4 and i-Button Function Selection	JP6, JP7, JP8
Cash Drawer Control Selection	JP11
Panel Resolution Slide Switch	SW1

System CONNECTOR Description	NAME
DC-IN Port (rear I/O)	DC-IN
COM Ports and Cash Drawer Port (rear I/O)	COM1, COM2, COM3, COM4 (option), DWR1
HDMI Port (rear I/O)	HDMI
LAN Port (rear I/O)	LAN
Dual USB 3.0 Ports (rear I/O)	USB1, USB2
Dual USB 2.0 Ports (rear I/O, side I/O)	USB3, USB4, USB5 (side I/O)
COM Connectors	COM1_1, COM2_1, COM4
VGA Connector	JVGA1
USB 2.0 Connectors	USB3_2, USB2, USB5, USB6, JUSB7
HD Audio Connector	JAUD1
LVDS Inverter Connector	JINV1
Embedded Display Port (EDP) Connector	EDP1
M.2 Wi-Fi Express Slot	M2_E
M.2 SSD Express Slot	M2_M
SATA 3.0 & SATA Power Connectors	SATA1, SATA_PWR1

System CONNECTOR Description	NAME
LPC Connector	JLPC1
Fan Connector	FAN_1
Power Output Connectors	OUT12V_1, OUT12V_2, OUT_24V
RTC Connector	BAT1
Speaker Connector	JSPK1
Switch LED Connectors	SW2, LED1

2.5 Function Buttons and I/O Ports

2.5.1 Power Button

Power Button

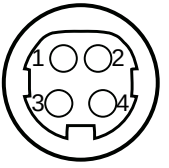
To turn on the system, press the power button on the side of the system briefly.

ACTION	ASSIGNMENT
Click	0V
Release	+5V

2.5.2 DC-IN Port (DC-IN)

Port Name: DC-IN

Description: DC Power-In Port (rear IO)



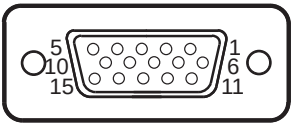
DC-IN

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

2.5.3 VGA Port (VGA)

Port Name: VGA

Description: VGA Port, D-Sub 15-pin (rear I/O)



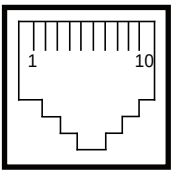
VGA

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	-	-

2.5.4 COM Port (COM1, COM2, COM3, COM4 (optional)

Port Name: COM1, COM2, COM3, COM4 (optional)
Description: COM Ports (rear I/O) (RS-232)

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

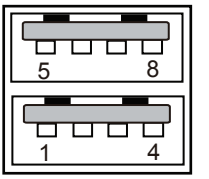


COM1/
COM2/
COM3/
COM4
(optional)

Note: COM4 will not function when jumpers JP6, JP7, JP8 are set as 2-3 connected (i-Button). Refer to the **i-Button Function Selection** section for details.

2.5.5 Dual USB 2.0 Ports (USB3, USB4, USB5)

Connector Location: USB3, USB4, USB5 (side I/O)
Description: Dual USB 2.0 Connectors (Type A) (Rear I/O)



USB3/
USB4/
USB5
(option)

- **USB3-4:** Rear I/O
- **USB5**: Side I/O (option)

USB 2.0 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5_USB3	5	VCC5_USB3
2	USB2_P3_DN	6	USB2_P4_DN
3	USB2_P3_DP	7	USB2_P4_DP
4	GND	8	GND

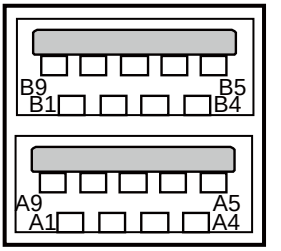
2.5.6 Dual USB 3.0 Ports (USB1, USB2)

Connector Location: USB1, USB2

Description: Dual USB 3.0 Connectors (rear I/O)

USB 3.0 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
B5	USB3_RXN0	-	-
B6	USB3_RXP0	B4	GND
B7	GND	B3	USB2_P0_DP
B8	USB3_TXN0	B2	USB2_P0_DN
B9	USB3_TXP0	B1	VCC5_USB1
A5	USB3_RXN1	-	-
A6	USB3_RXP1	A4	GND
A7	GND	A3	USB2_P1_DP
A8	USB3_TXN1	A2	USB2_P1_DN
A9	USB3_TXP1	A1	VCC5_USB1



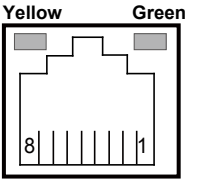
USB1/
USB2

2.5.7 LAN Port (LAN)

Port Name: LAN

Description: LAN RJ-45 Port (rear I/O)

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



LAN

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.

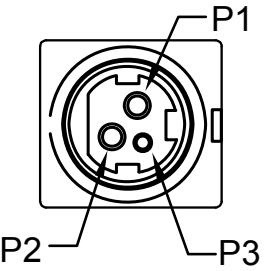
RA Ver.

LAN LED Indicator	Color	Status	Description
Left Side LED	Yellow	Blink	LAN connection is activated.
	-	Off	No LAN message active.
Right Side LED	Green	On	100 LAN connection is activated.
	Orange	On	Giga LAN connection is activated.
	-	Off	No LAN switch/ hub is activated.

2.5.8 Printer Power Port (PRINT PWR) (optional)

Port Name: PRINT PWR (rear I/O)
Description: DC24V power supply for the stand-printer

PIN	ASSIGNMENT
P1	+24V
P2	+24V
P3	GND
P4	GND

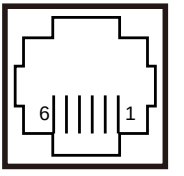


PRINT PWR
(option)

2.5.9 Cash Drawer Port (DRW1)

Port Name: DRW1 (rear I/O)
Description: Cash Drawer Port
DRW1 is used by default.

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

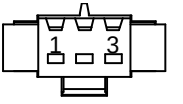


DR**W**1

2.5.10 2nd Display Power Port (2nd DIS PWR) (optional)

Port Name: 2nd DIS PWR (rear I/O)
Description: DC12V power supply for 2nd display

PIN	ASSIGNMENT
1	VCC12
2	VCC12
3	GND

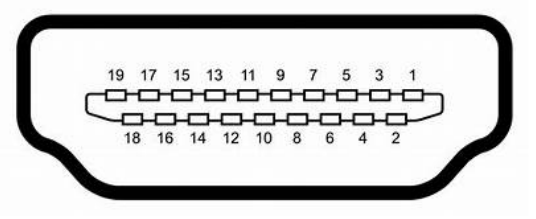


2ND DIS PWR

2.5.11 HDMI Port Connector (HDMI)

Port Name: HDMI

Description: HDMI Connector (rear I/O)



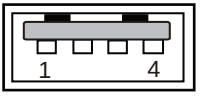
HDMI

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP0_HDMI_P2	2	GND
3	DP0_HDMI_N2	4	DP0_HDMI_P1
5	GND	6	DP0_HDMI_N1
7	DP0_HDMI_P0	8	GND
9	DP0_HDMI_N0	10	DP0_HDMI_CLKP
11	GND	12	DP0_HDMI_CLKN
13	NC	14	NC
15	DP0_HDMI_SCL_5V	16	DP0_HDMI_SDA_5V
17	GND	18	VCC5_HDMI
19	DP1_HDMI_HPD_IN	20	-

2.5.12 Power USB Connector (PWR USB) (optional)

Port Name: PWR USB (rear I/O)
Description: Power USB Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+5V	5	GND
2	D-	6	12V/24V
3	D+	7	12V/24V
4	GND	8	GND



PWR USB
(option)

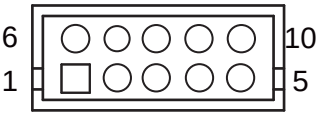
2.6 Setting Main Board Connectors and Jumpers

2.6.1 COM Port Voltage Selection

COM1 / COM2
The voltages of the external ports "COM1 & COM2" can be adjusted via BIOS for your convenience.

2.6.2 COM Connectors (COM1_1, COM2_1, COM4)

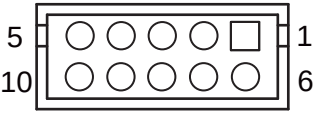
Connector Location: COM1_1, COM2_1 (RS-232)
Description: COM Connectors



COM1_1/
COM2_1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM1/2_DCD	6	COM1/2_DSR
2	COM1/2_RX	7	COM1/2_RTS
3	COM1/2_TX	8	COM1/2_CTS
4	COM1/2_DTR	9	COM1/2_RI_SEL
5	GND	10	NC

Connector Location: COM4 (RS-232)
Description: COM4 Connector



COM4

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM4_DCD	6	COM4_DSR
2	COM4_RX	7	COM4_RTS
3	COM4_TX	8	COM4_CTS
4	COM4_DTR	9	COM4_RI
5	GND	10	NC

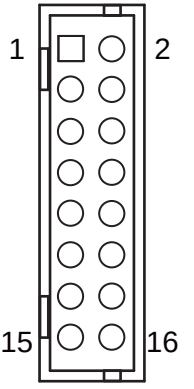
Note: COM4 will not function when jumpers JP6, JP7, JP8 are set as **2-3** connected (i-Button). Refer to the **COM4 & i-Button Function Selection** section for details.

2.6.3 VGA Connector (JVGA1)

Connector Location: JVGA1

Description: VGA Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CRT_RED_LL	2	CRT_GREEN_LL
3	CRT_BLUE_LL	4	SPC_R
5	GND	6	GND
7	GND	8	GND
9	CRT_VCC_L	10	GND
11	SPD_R	12	CRT_DDC_DATA_O
13	CRT_HSYNC_O	14	CRT_VSYNC_O
15	CRT_DDC_CLK_O	16	NC

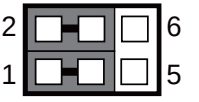
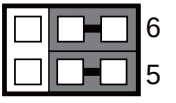


JVGA1

2.6.4 PWM & BKLTCTL Signal Selection (JP4)

Jumper Location: JP4

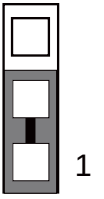
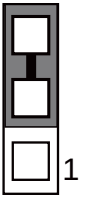
Description: "PWM & BKLTCTL signal support to" selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
PWM & BKLTCTL signal from CPU	1-3, 2-4	 JP4
PWM & BKLTCTL signal from CH7511	**3-5, 4-6** ***(Default Setting)***	 JP4

2.6.5 PWM Voltage Selection (JP5)

Jumper Location: JP5

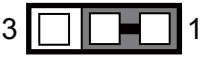
Description: PWM voltage Selection

Selection	Jumper Setting	Jumper Illustration
3.3V	**1-2** ***(Default Setting)***	 JP5
5V	2-3	 JP5

2.6.6 COM4 & i-Button Function Selection (JP6, JP7, JP8)

Jumper Location: JP6, JP7, JP8

Description: COM4 and i-Button Function Selection

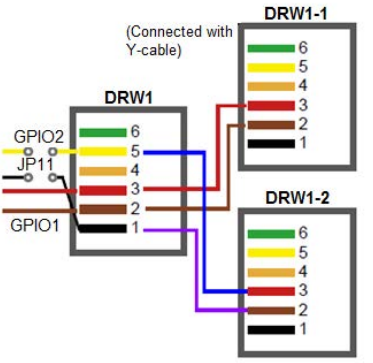
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM4	**1-2** *(Default Setting)*	 JP6/JP7/JP8
I-BUT	2-3	 JP6/JP7/JP8

Note: COM4 will not function when jumpers JP6, JP7, JP8 are set as **2-3** connected (i-Button). Refer to the **COM4 & i-Button Function Selection** section for details.

2.6.7 Cash Drawer Control Selection (JP11)

JP11: 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:

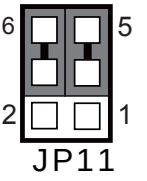
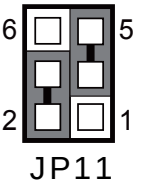
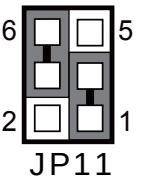
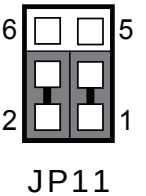
DRW1 includes two groups of GPIO pins. The second group is normally unused but can be enabled by the jumper. Set the pin header jumper JP11 as 1-2 connected if necessary.

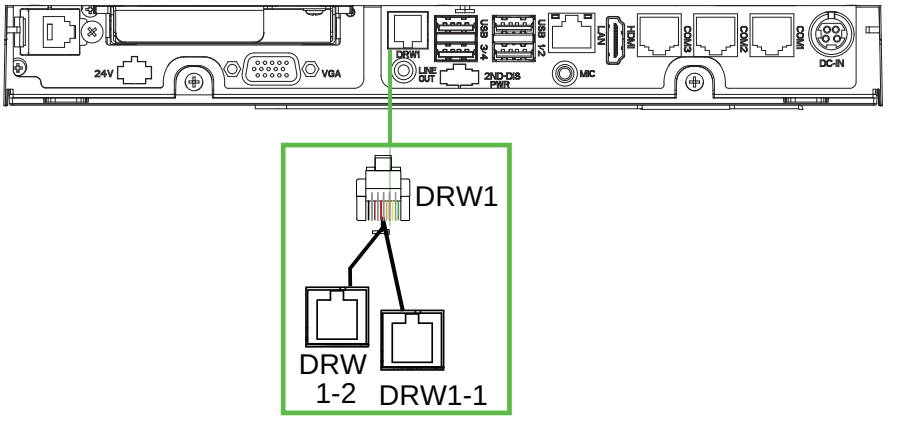
Method 2:

You can split DRW1 into two channels of DRW1-1 & DRW1-2 using the Y-Cable (option).

Jumper Location: JP11

Description: Cash Drawer Selection

Selection	Jumper Setting	Jumper Illustration
1 Drawer & 12V	**3-5, 4-6** ***(Default Setting)***	
1 Drawer & 24V	2-4, 3-5	
2 Drawers & 12V	1-3, 4-6	
2 Drawers & 24V	1-3, 2-4	



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 F81966 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).

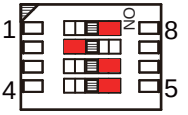
(2) Configure the configuration registers
The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). 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.

2.6.8 Slide Switch for Panel Resolution Selection (SW1)

Jumper Location: SW1

Description: Slide Switch for Panel Resolution Selection

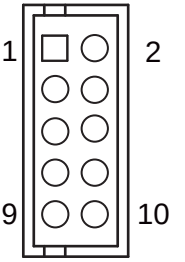
SELECTION	SW1	PIN	SETTING
1024 x 768 (24 bit) ***(Default Setting)***	 SW1	1	OFF
		2	OFF
		3	ON
		4	OFF

2.6.9 USB 2.0 Connector (USB3_2)

Connector Location: USB3_2

Description: USB 2.0 Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5_USB3	2	VCC5_USB3
3	USB2_P3_DN	4	USB2_P4_DN
5	USB2_P3_DP	6	USB2_P4_DP
7	GND	8	GND
9	GND	10	GND



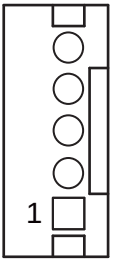
USB3_2

2.6.10 USB 2.0 Connectors (USB2, USB5, USB6, JUSB7)

Connector Location: USB2

Description: USB 2.0 Connector

PIN	ASSIGNMENT
1	VCC5
2	USB2_P2_DN
3	USB2_P2_DP
4	GND
5	GND



USB2/
USB5/
USB6

Connector Location: USB5

Description: USB 2.0 Connector

PIN	ASSIGNMENT
1	VCC5_USB5
2	USB2_P5_DN
3	USB2_P5_DP
4	GND
5	GND

Connector Location: USB6

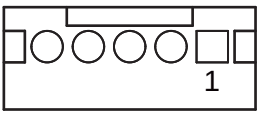
Description: USB 2.0 Connector

PIN	ASSIGNMENT
1	VCC5_USB5
2	USB2_P6_DN
3	USB2_P6_DP
4	GND
5	GND

Connector Location: JUSB7

Description: USB 2.0 Connector

PIN	ASSIGNMENT
1	VCC5
2	USB2_P7_DN
3	USB2_P7_DP
4	GND
5	GND



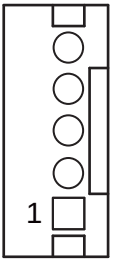
JUSB7

2.6.11 Touch Panel Connector (TOUCH1)

Connector Location: TOUCH1

Description: Touch Panel Connector

PIN	ASSIGNMENT
1	VCC5
2	USB2_P2_DN
3	USB2_P2_DP
4	GND
5	GND



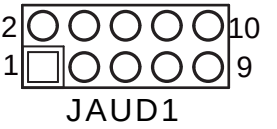
TOUCH1

2.6.12 HD Audio Connector (JAUD1)

Connector Location: JAUD1

Description: HD Audio Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HD_MIC-L	2	HD_GND
3	HD_MIC-R	4	PRESENCE_N
5	LINE-OUT-R	6	MIC-JD
7	HD_GND	8	NC
9	LINE-OUT-L	10	LINE-OUT-JD

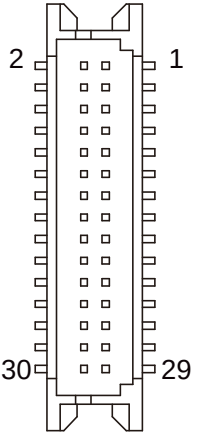


2.6.13 Embedded Display Port (EDP) Connector (EDP1)

Connector Location: EDP1

Description: EDP Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	EDP_DCR_EN	2	GND
3	EDP_SELF_TEST	4	DDP_ P1
5	NC	6	DDP_ N1
7	EDP_DET	8	GND
9	SOC_BKLTEN	10	DDP_ N0
11	PANEL_BKLTCTL	12	DDP_ P0
13	NC	14	GND
15	GND	16	DP_AUX_DP
17	GND	18	DP_AUX_DN
19	V12P0_INV	20	GND
21	V12P0_INV	22	NC
23	V12P0_INV	24	GND
25	V12P0_INV	26	LVDS_VCC
27	GND	28	LVDS_VCC
29	GND	30	GND

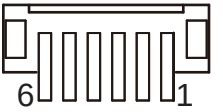


EDP1

2.6.14 LVDS Inverter Connector (JINV1)

Connector Location: JINV1
Description: LVDS Inverter Connector

PIN	ASSIGNMENT
1	V12P0_INV
2	V12P0_INV
3	GND
4	LVDS_BKLCTL
5	GND
6	LVDS_BKLTEN

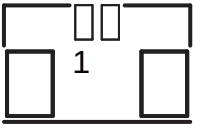


JINV1

2.6.15 i-Button Connector (I-BUT)

Connector Location: I-BUT
Description: i-Button Connector

PIN	ASSIGNMENT
1	COM4_DTR_R_I
2	COM4_RXD_R_I



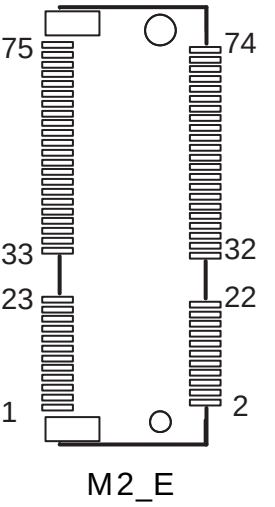
I-BUT

2.6.16 M.2 Wi-Fi Express Slot (M2_E)

Connector Location: M2_E

Description: M.2 Wi-Fi Express Slot

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	V3P3S
3	USB2_P2_DP	4	V3P3S
5	USB2_P2_DN	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	PCIE_P1_TXP	36	NC
37	PCIE_P1_TXN	38	NC
39	GND	40	NC
41	PCIE_P1_RXP	42	NC
43	PCIE_P1_RXN	44	NC
45	GND	46	NC
47	M2_PCIE_CLKP	48	NC
49	M2_PCIE_CLKN	50	SUSCLK
51	GND	52	WIFI_RST_
53	M2_PCIE_CLKREQ	54	KILL_BT_N
55	WAKE_M2_PCIE_N	56	KILL_WIFI_N
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	V3P3S
73	NC	74	V3P3S
75	GND	-	-



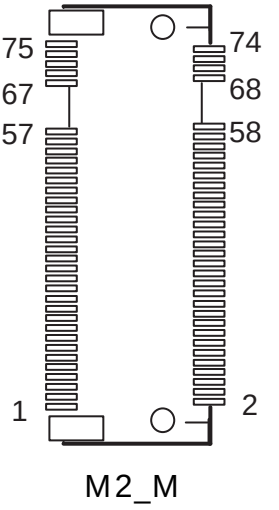
M2_E

2.6.17 M.2 SSD Express Slot (M2_M)

Connector Location: M2_M

Description: M.2 SSD KEY M Slot

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	V3P3S
3	GND	4	V3P3S
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	SATA_DEVSLP1
39	GND	40	NC
41	SATA_RXP1	42	NC
43	SATA_RXN1	44	NC
45	GND	46	NC
47	SATA_TXN1	48	NC
49	SATA_TXP1	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	V3P3S
71	GND	72	V3P3S
73	GND	74	V3P3S
75	GND	-	-

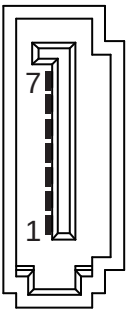


M2_M

2.6.18 SATA 3.0 & SATA Power Connectors (SATA1, SATA_PWR1)

Connector Location: SATA1
Description: Serial ATA 3.0 connector

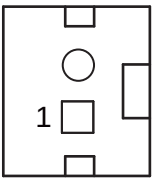
PIN	ASSIGNMENT
1	GND
2	SATA_TXP0
3	SATA_TXN0
4	GND
5	SATA_RXN0
6	SATA_RXP0
7	GND



SATA1

Connector Location: SATA_PWR1
Description: HDD Power Connector

PIN	ASSIGNMENT
1	VCC5
2	GND



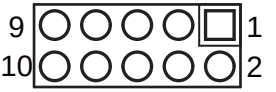
SATA_PWR1

2.6.19 LPC Connector (JLPC1)

Connector Location: JLPC1

Description: Low Pin Count Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LPC_CLKOUT1	2	GND
3	LPC_LFRAMEJ	4	GND
5	PMU_PLTRST_N	6	LPC_AD0
7	LPC_AD3	8	LPC_AD2
9	V3P3A	10	LPC_AD1



JLPC1

2.6.20 Fan Connector (FAN_1)

Connector Location: FAN_1

Description: Fan Connector

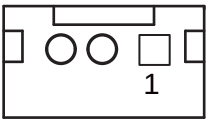
PIN	ASSIGNMENT
1	GND
2	V12P0S
3	FANIN
4	FANOUT

FAN_1

2.6.21 Power Output Connectors (OUT12V_1, OUT12V_2, OUT_24V)

Connector Location: OUT12V_1
Description: Output 12V Wafer

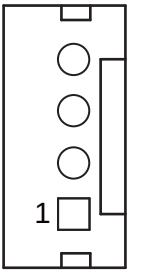
PIN	ASSIGNMENT
1	V12P0S
2	V12P0S
3	GND



OUT12V_1

Connector Location: OUT12V_2
Description: Output 12V Wafer

PIN	ASSIGNMENT
1	V12P0S
2	V12P0S
3	GND
4	GND



OUT12V_2 /
OUT24V

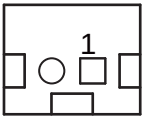
Connector Location: OUT24V
Description: Output 24V Wafer

PIN	ASSIGNMENT
1	VIN_24V
2	VIN_24V
3	GND
4	GND

2.6.22 RTC Connector (BAT1)

Connector Location: BAT1
Description: RTC Connector

PIN	ASSIGNMENT
1	VBAT
2	GND

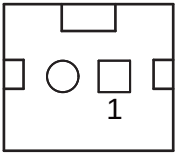


BAT1

2.6.23 Speaker Connector (JSPK1)

Connector Location: JSPK1
Description: Speaker Connector

PIN	ASSIGNMENT
1	HD_SPK_R
2	HD_SPK_L

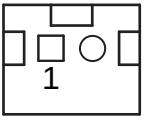


JSPK1

2.6.24 Switch LED Connectors (SW2, LED1)

Connector Location: SW2
Description: Power Button

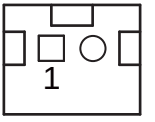
PIN	ASSIGNMENT
1	GND
2	PWRBTNJ



SW2

Connector Location: LED1
Description: System Power LED

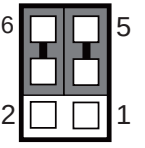
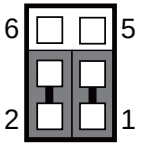
PIN	ASSIGNMENT
1	GND
2	V5P0S



LED1

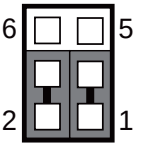
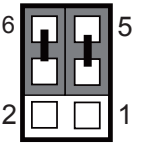
2.6.25 USB2 Port Selection (JP_USB2)

Jumper Location: JP_USB2
Description: USB2 Port Selection

Selection	Jumper Setting	Jumper Illustration
M.2 USB	1-3, 2-4	 JP_USB2
USB2	**3-5, 4-6** ***(Default Setting)***	 JP_USB2

2.6.26 USB3 Port Selection (JP_USB3_1, JP_USB3_2)

Jumper Location: JP_USB3_1, JP_USB3_2
Description: USB3 Port Selection

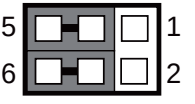
Selection	Jumper Setting	Jumper Illustration
USB3_1 (See Note 1)	**1-3, 2-4** ***(Default Setting)***	 JP_USB3_1/ JP_USB3_2
USB3_2 (See Note 2)	3-5, 4-6	 JP_USB3_1/ **JP_USB3_2**

Note 1: Internal USB3_1 will be disabled.
Note 2: External 2 x USB 2.0 ports will be disabled.

2.6.27 USB5 Port Selection (JP_USB5)

Jumper Location: JP_USB5

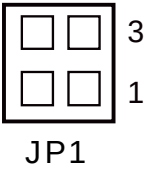
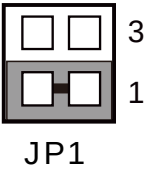
Description: USB5 Port Selection

Selection	Jumper Setting	Jumper Illustration
USB5	**3-5, 4-6** ***(Default Setting)***	 JP_USB5

2.6.28 Force DNX Firmware Load Selection (JP1)

Jumper Location: JP1

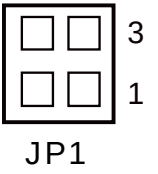
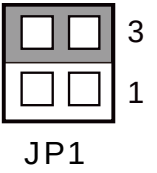
Description: Force DNX Firmware Load Selection

Selection	Jumper Setting	Jumper Illustration
Normal	**Open** ***(Default Setting)***	
Force	1-2	

2.6.29 Flash Descriptor Override Selection (JP1)

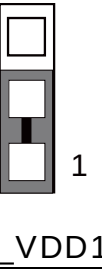
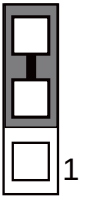
Jumper Location: JP1

Description: Flash Descriptor Override Selection

Selection	Jumper Setting	Jumper Illustration
Normal	**Open** ***(Default Setting)***	
Override	3-4	

2.6.30 EDP (Embedded Display Port) Voltage Selection (JP_VDD1)

Jumper Location: JP_VDD1
Description: EDP Voltage Selection

Selection	Jumper Setting	Jumper Illustration
3.3V	**1-2** ***(Default Setting)***	 JP_VDD1
5V	2-3	 JP_VDD1

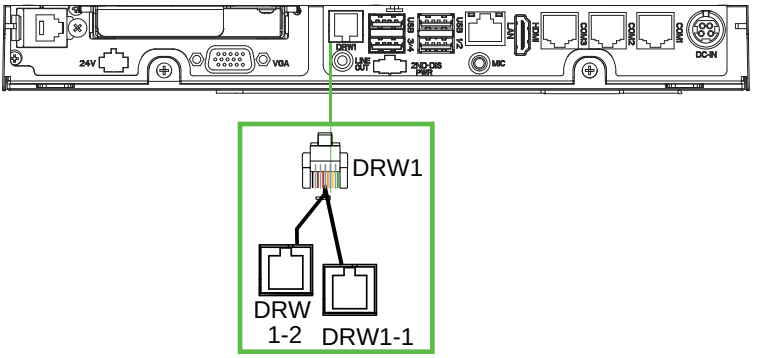
2.6.31 Clear CMOS Data Selection (JP3)

Jumper Location: JP3
Description: Clear CMOS Data Selection
Step 1. Remove the main power of the PC.
Step 2. Close JP3 (pins 1-2) for 6 seconds by a cap.
Step 3. Remove the cap which is just used on JP3 (1-2), so that JP3 returns to "OPEN".
Step 4. Power on the PC and the PC will then auto-reboot for once in order to set SoC's register.
Step 5. Done!

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	**Open** ***(Default Setting)***	 1 JP3
Clear CMOS*	1-2	 1 JP3

Note: Please make sure the main power is off before you clear CMOS data.

2.6.32 Cash Drawer Control Selection



Step 1.
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

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
```

2.7 Printer Board Component Locations & Pin Assignment

2.7.1 Printer Board: PDAC-3100

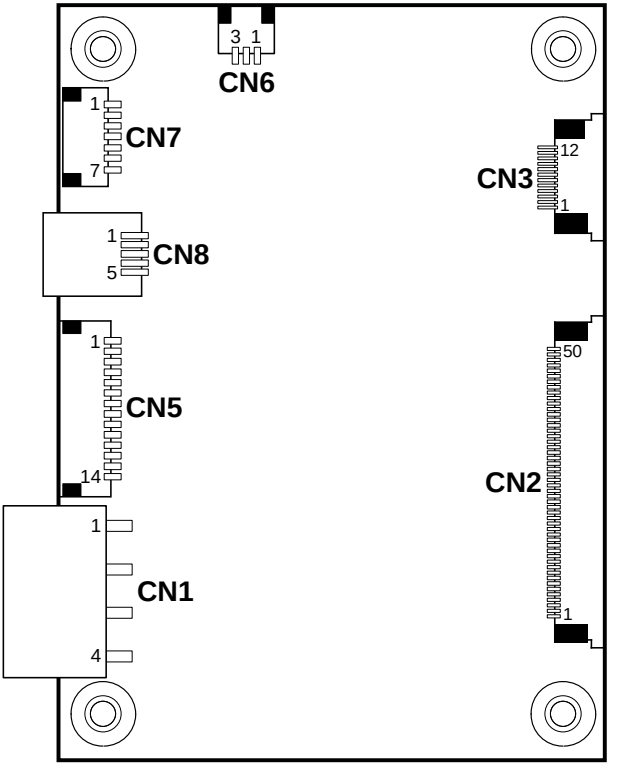


Figure 2-2. PDAC-3100 Printer Board Component Locations

2.7.2 Jumper & Connector Quick Reference Table

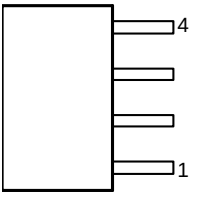
Jumper / Connector	**NAME**
Power Supply Connector	CN1
RS-232 Interface Connector	CN7
Auto-Cutter Connector	CN3
USB Connector	CN8
Thermal Head/Motor/Sensor Connector	CN2
Terminal Assignment Connector	CN5

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

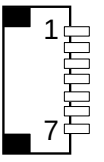


CN1

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	-	-

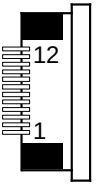


CN7

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

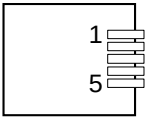


CN3

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
36	24V	Head drive power

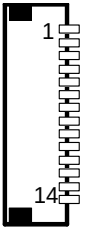
CN2

PIN	ASSIGNMENT	FUNCTION
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

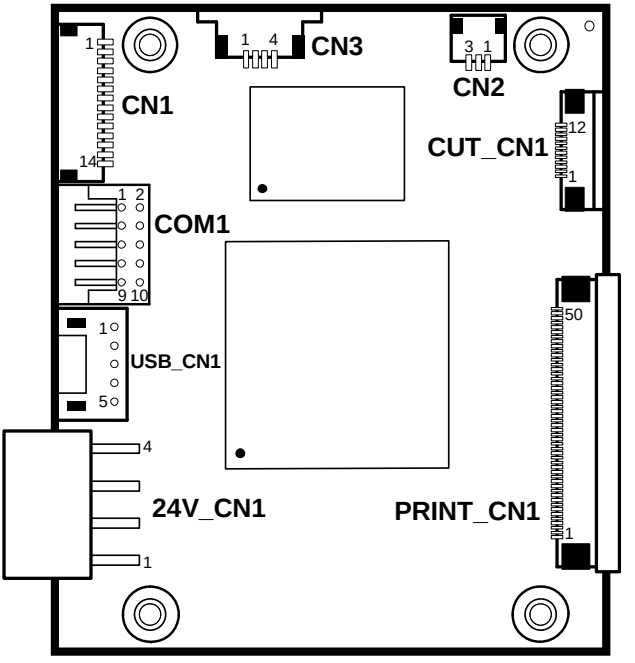


Figure 2-3. MB-1030 Printer Board Component Locations

2.7.4.1 Jumper & Connector Quick Reference Table

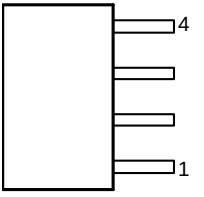
Jumper / Connector	NAME
Power Supply Connector	24V_CN1
RS-232 Interface Connector	COM1
Thermal Head/Motor/Sensor Connector	PRINT_CN1
Auto-Cutter Connector	CUT_CN1
Paper-Near-END Sensor Connector	CN2
USB Interface Connector	USB_CN1
Terminal Assignment Connector	CN1

2.7.5 Setting Printer Board Connectors and Jumpers : MB-3010

2.7.5.1 Power Supply Connector

24V_CN1: Power Supply Wafer

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

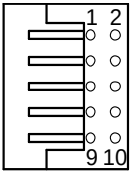


24V_CN1

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

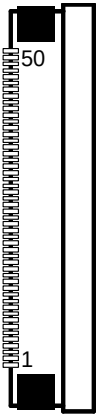


COM1

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
36	24V	Head drive power



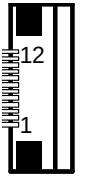
PRINT_CN1

PIN	ASSIGNMENT	FUNCTION
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

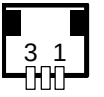


CUT_CN1

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

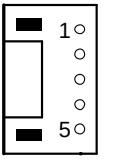


CN2

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+	-	-

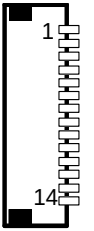


USB_CN1

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

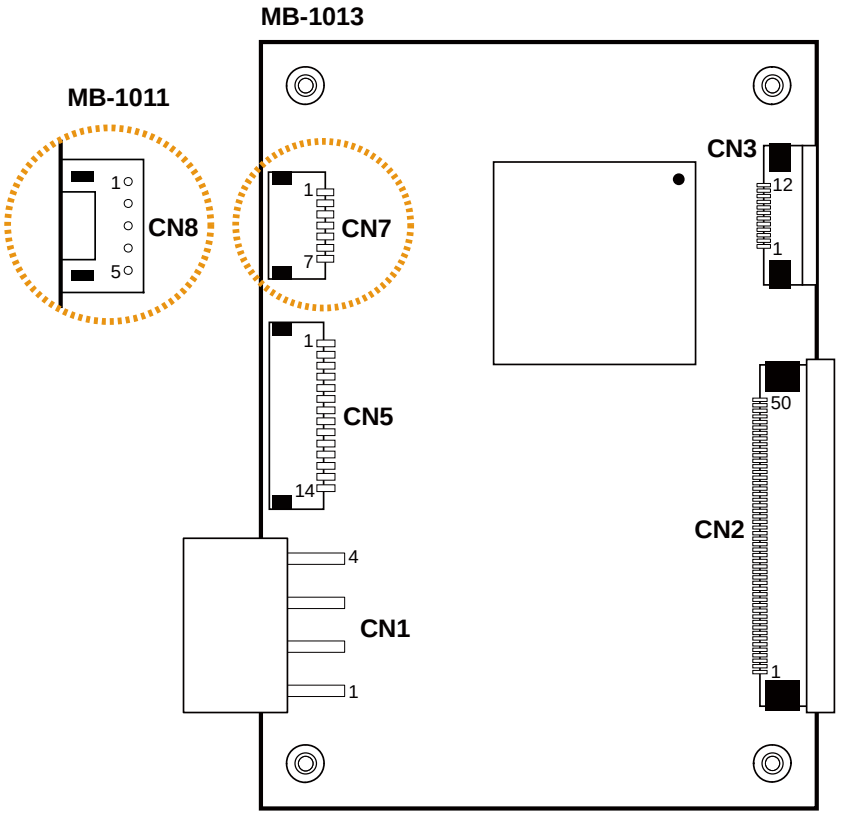


Figure 2-4. MB-1011 & MB-1013 Printer Board Component Locations

2.7.6.1 Jumper & Connector Quick Reference Table

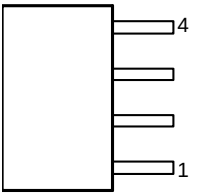
Jumper / Connector	NAME
Power Supply Connector	CN1
RS-232 Interface Connector	CN7
Auto-Cutter Connector	CN3
Thermal Head/Motor/Sensor Connector	CN2
Terminal Assignment Connector	CN5
USB Interface Connector	CN8

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

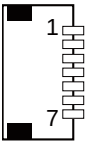


CN1

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	-	-

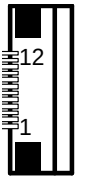


CN7

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

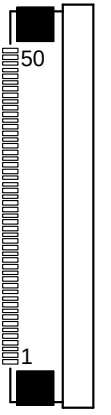


CN3

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
14	GND	Head GND



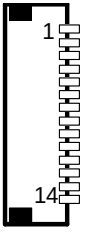
CN2

PIN	ASSIGNMENT	FUNCTION
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
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

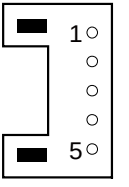


CN5

2.7.7.6 USB Interface Connector

CN8: USB interface connector

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



CN8

2.8 VFD Board Component Locations & Pin Assignment

2.8.1 VFD Board: MB-4103, LD720

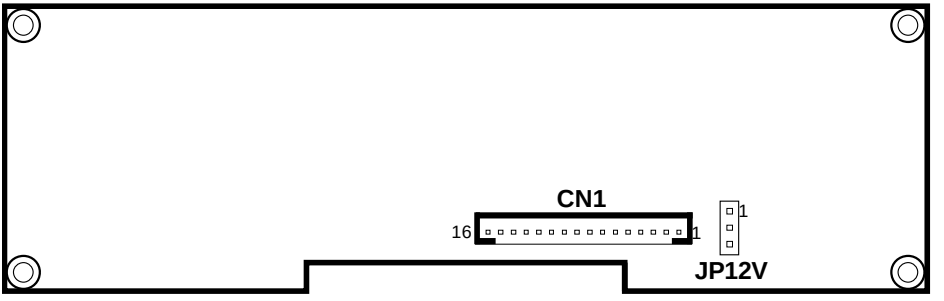


Figure 2-5. MB-4103 & LD720 VFD Board Component Locations

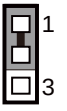
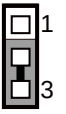
2.8.2 Jumper & Connector Quick Reference Table

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

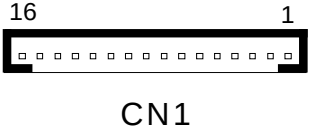
JP12V: Power Switch Selection

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



2.9 MSR Board Component Locations & Pin Assignment

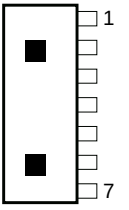
2.9.1 ID TECH

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	-	-



CN

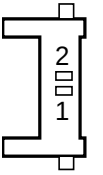
2.9.2 MB-3012

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

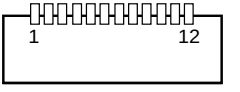


I_BUTTON1

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, embedded peripheral devices and API. The following topics are included:

- Driver
  - Intel® Chipset Software Installation Utility
  - Graphics Driver Utility
  - LAN Driver Utility
  - Sound Codec Driver Utility
  - Intel® Trusted Execution Engine Installation Utility
  - Intel® Serial I/O Driver Utility
  - Microsoft Hotfix Driver Utility
  - Intel® Processor Win10 IO Driver Utility
- Embedded Peripheral Devices
  - Printer
  - VFD
  - MSR
- API

3.1 Driver Disc

Enclosed with the PA-J670 Series package is our driver utilities, which comes in a DVD-ROM format. Refer to the following table for driver locations

Windows 10 Enterprise 2016 LTSB_64Bit

Filename (Assume that DVD- ROM drive is D :)	Purpose
D:\DRIVER\Platform\1_Main Chip\Win10 2016(64-bit)	Intel(R) Chipset Device Software Installation Utility
D:\DRIVER\Platform\2_HotFix\ Win10 2016(64-bit)	Microsoft Hotfix kb3211320 and kb3213986
D:\DRIVER\Platform\3_Graphics\ Win10 2016(64-bit)	Intel Graphics Driver installation
D:\DRIVER\Platform\4_TXE\Win10 2016(64-bit)	Intel(R) Trusted Execution Engine
D:\DRIVER\Platform\5_Sound Codec\Win10 2016(64-bit)	Realtek High Definition Audio driver installation
D:\DRIVER\Platform\6_LAN Chip\Win10 2016(64-bit)	Intel(R) Network Connections Software
D:\DRIVER\Platform\7_IO\Win10 2016(64-bit)	Intel Processor Win10 IO Drivers
D:\DRIVER\Platform\8_Serial IO\Win10 2016(64-bit)	Intel(R) Serial IO Driver

Windows 10 Enterprise 2019 LTSC_64Bit

Filename (Assume that DVD- ROM drive is D :)	Purpose
D:\DRIVER\Platform\1_Main Chip\Win10 2019(64-bit)	Intel(R) Chipset Device Software Installation Utility
D:\DRIVER\Platform\3_Graphics\ Win10 2019(64-bit)	Intel Graphics Driver installation
D:\DRIVER\Platform\4_TXE\Win10 2019(64-bit)	Intel(R) Trusted Execution Engine
D:\DRIVER\Platform\5_Sound Codec\Win10 2019(64-bit)	Realtek High Definition Audio driver installation
D:\DRIVER\Platform\6_LAN Chip\Win10 2019(64-bit)	Intel(R) Network Connections Software

Note: Users must install the driver utilities right after the OS is fully installed.

3.2 Intel® Chipset Software Installation Utility

Introduction

The Intel® Chipset Software Installation Utility installs the 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 that the following functions work properly:

- Core PCI and ISAPNP Services
- PCI-e Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

Intel® Chipset Software Installation Utility

The utility pack is to be installed only for Windows 10 2016 (64-bit) and Windows 10 2019 (64-bit), and it should be installed immediately after the OS installation is finished. Please follow the steps below:

1 Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.

2 Enter the **Main Chip** folder where the Chipset driver is located.

3 Click **SetupChipset.exe** file for driver installation.

4 Follow the on-screen instructions to install the driver.

5 Once the installation is completed, shut down the system and restart PA-J670 for the changes to take effect.

3.3 Installing Graphics Driver Utility

The Graphics interface embedded in PA-J670 can support multiple displays via VGA, HDMI interfaces and make the system work simultaneously.

To install the Graphics driver utility, follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Enter the **Graphics** folder where the driver is located.
3. Click **Setup.exe** file for Windows 10 2016 (64-bit) driver installation.
   Click **igxpin.exe** file for Windows 10 2019 (64-bit) 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-J670 for the changes to take effect.

3.4 LAN Driver Utility

Enhanced with LAN function, PA-J670 supports various network adaptors. To install the LAN Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Enter the **LAN** folder where the driver is located.
3. Click **PROWinx64(LAN).exe** file for Windows 10 2016 (64-bit) driver installation.
   Click **Autorun.exe** file for Windows 10 2019 (64-bit) 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-J670 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.

3.5 Sound Driver Utility

To install the Sound Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Open the **Sound Codec** folder where the driver is located.
3. Click the **Setup.exe** file for Windows 10 2016 (64-bit) and Windows 10 2019 (64-bit) 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-J670 for the changes to take effect.

3.6 Installing Intel® Trusted Execution Engine Installation Utility

To install the utility, simply follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Enter the **TXE** folder where the driver is located.
3. Click **SetupTXE.exe** file for Windows 10 2016 (64-bit) and Windows 10 2019 (64-bit) 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-J670 for the changes to take effect.

3.7 Installing Intel® Serial I/O Driver Utility

To install the Serial I/O Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Open the **Serial IO** folder where the driver is located.
3. Click the **SetupSerialIO.exe** file for Windows 10 2016 (64-bit) 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-J670 for the changes to take effect.

3.8 Installing Microsoft Hotfix Driver Utility

The Microsoft Hotfix Driver that needs to be installed depends on the system's specific hardware and firmware features. The installer, compatible with Windows 10, detects the system's capabilities and installs the relevant drivers and applications.

To install the utility, simply follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Enter the **Hotfix** folder where the driver is located.
3. Click the **windows10.0-kb3211320-x64_2abc94fceb4d1cdd908b3bdba473e28e0c061a3d** and **windows10.0-kb3213986-x64_a1f5adacc28b56d7728c92e318d6596d9072aec4** files for critical security update for Windows 10 2016 (64-bit) 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-J670 for the changes to take effect.

3.9 Installing Intel® Processor Win10 IO Driver Utility

To install the utility, simply follow the steps below:

1. Connect the USB DVD-ROM device to PA-J670 and insert the driver disk.
2. Enter the **IO** folder where the driver is located.
3. Click the **Intel_Processor_Win10_IO_Drivers_64Bit.exe** file for Windows 10 2016 (64-bit) 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-J670 for the changes to take effect.

3.10 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:

3.10.1 Printer Board: MB-1030

3.10.1.1 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
Other 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
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

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<ESC E>	1B 45	Turn emphasized mode on/off	V	V
<ESC G>	1B 47	Turn double-strike mode on/off	V	V
<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	◎	▲
<GS \>	1D 5C	Set relative vertical print position in page mode	Ignored	

Control Codes	Hexadecimal Codes	Function	Standard Mode	Page Mode
<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.

COMMANDS 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 standar 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.

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

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
[Description]	Selects a bit-image mode in mode *m* for the number of dots specified by *nL* and *nH*. 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).

m	Mode	Number of Vert. Dir. Dots	Density of Vert. Dir. Dots	Density of Hor. Dir. Dots	Data Count (k)
0	8 dot single density	8	67 DPI	101 DPI	nL+nH×256
1	8 dot double density	8	67 DPI	203 DPI	nL+nH×256
32	24 dot single density	24	203 DPI	101 DPI	(nL+nH×256) ×3
33	24 dot double density	24	203 DPI	203 DPI	(nL+nH×256) ×3

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
[Description]	This command enables the print data following it to be printer out underlined. The underline mode varied depending on the following values of n:

n	**Function**
0	Turns off underline mode
1	Turns on underline mode, set at 1-dot thick
2	Turns on underline mode, set at 2-dot thick

ESC 2

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

ESC 3 n

[Name]	Set line spacing.
[Format]	ASCII ESC 3 n Hex. 1B 33 n Decimal 27 51 n
[Range]	0 ≤ 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 ≤ n ≤ 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:

n	Function
0	Character font A selected
1	Character font B selected

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

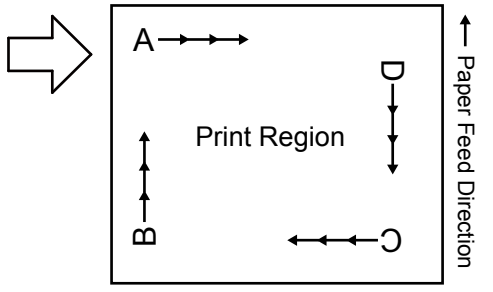
ESC S

[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)



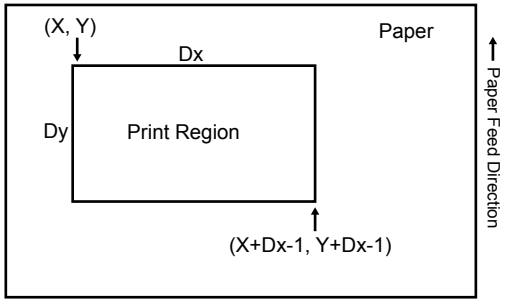
ESC V n

[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: n: Alignment 0: Left alignment 1: Center alignment 2: Right alignment 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

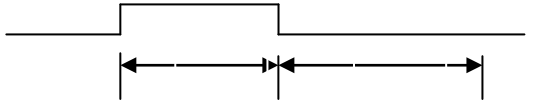
ESC m

[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 ≤ m ≤ 1, 48 ≤ m ≤ 49 0 ≤ t1 ≤ 255 0 ≤ t2 ≤ 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.

m	Connector Pin
0, 48	Drawer kick connector pin #□
1, 49	Drawer kick connector pin #5



ESC t n

[Name]	Select character code table.
[Format]	ASCII ESC t n Hex. 1B 74 n Decimal 27 116 n
[Range]	0 ≤ n ≤ 8 Initial Value n = 0
[Description]	Select page n of the character code table.

n	Character set
0	CP-437
1	Katakana
2	CP-850
3	CP-852
4	CP-860
5	CP-863
6	CP-865
7	CP-1252
8	User Define

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

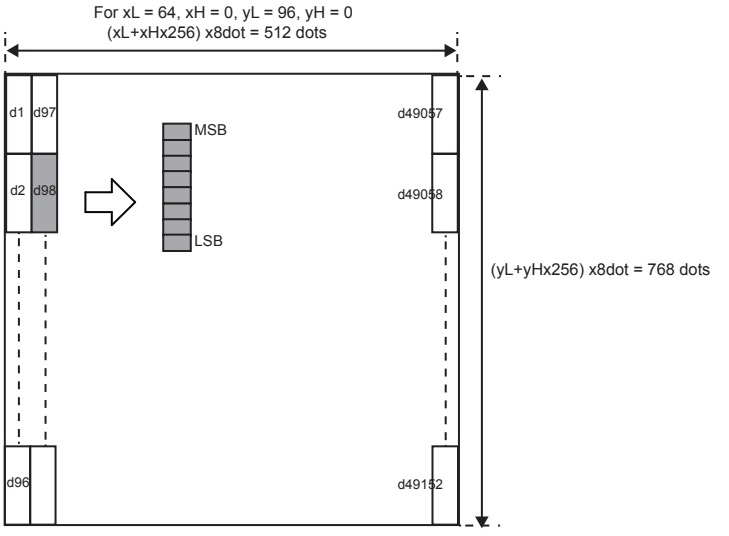
FS p n m

[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 ≤ n ≤ 255 1 ≤ (xL + xH ×256) ≤ 54 (0 ≤ xL ≤ 54, xH=0) for 2 inch 1 ≤ (xL + xH ×256) ≤ 72 (0 ≤ xL ≤ 72, xH=0) for 3 inch 1 ≤ (yL + yH ×256) ≤ 96 (0 ≤ yL ≤ 96, yH=0) 0 ≤ d ≤ 255 k = (xL + xH × 256) × (yL + yH × 256) × 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

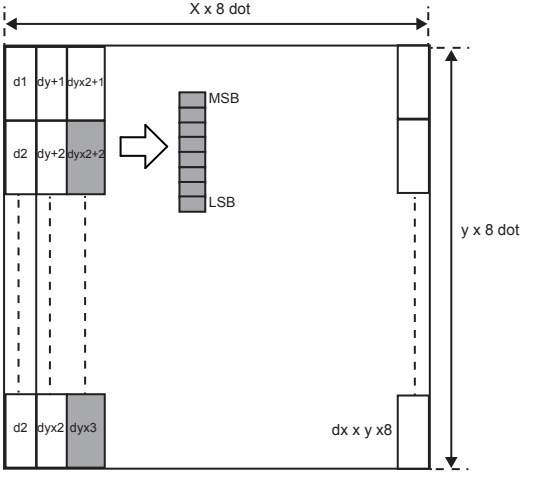
Table 2 [Enlarged in vertical direction]

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 ≤ nL ≤ 255, 0 ≤ nH ≤ 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 ≤ X ≤ 54 (for 2 inch) 1 ≤ X ≤ 72 (for 3 inch) 1 ≤ Y ≤ 96 0 ≤ d ≤ 255
[Description]	Defines the download bit image of the number of dots specified by X and Y. ● 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

<table>
<tr><td>[Name]</td><td>Execute test print.</td></tr>
<tr><td>[Format]</td><td>ASCII GS (A pL pH n m
Hex. 1D 28 41 pL pH n m
Decimal 29 40 65 pL pH n m</td></tr>
<tr><td>[Range]</td><td>{pL+ (pH×256) } = 2 (pL = 2,pH = 0)
0 ≤ n ≤ 2 , 48 ≤ n ≤ 50
2 ≤ m ≤ 3 , 50 ≤ m ≤ 51</td></tr>
<tr><td>[Description]</td><td>Executes the specified test print.
The following command is ignored in page mode.

Specifies the parameter count following pL and pH in (pL + (pH x 256)) bytes.
n specifies the paper to be tested.
<table>
<tr><td>n</td><td>Paper Type</td></tr>
<tr><td>0 , 48</td><td>Basic sheet (paper roll)</td></tr>
<tr><td>1 , 49
2 , 50</td><td>Paper Roll</td></tr>
</table>
m specifies a test pattern..
<table>
<tr><td>m</td><td>Type of Test Print</td></tr>
<tr><td>2 , 50</td><td>Printer Status (Self Print)</td></tr>
<tr><td>3 , 51</td><td>Rolling Pattern Print</td></tr>
</table></td></tr>
</table>

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.

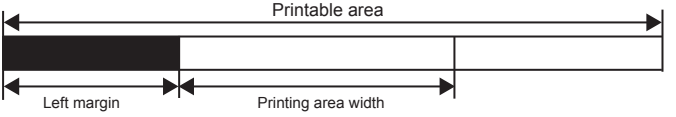
m	Printing Position
0, 48	No print
1, 49	Above bar code
2, 50	Below bar code
3, 51	Above and below bar code(both)

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:

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

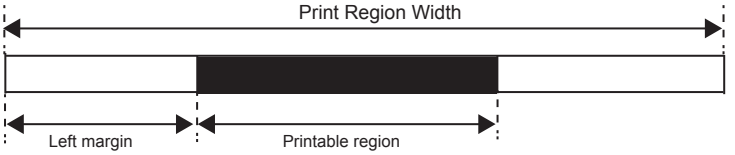
[Name]	Set basic calculated pitch.
[Format]	ASCII GS P x y Hex. 1D 50 x y Decimal 29 80 x y
[Range]	0 ≤ x ≤ 255 0 ≤ y ≤ 255 Initial Value x = 203, y = 203: EPSON targeted model print head 203 DPI
[Description]	Sets the horizontal basic calculated pitch to approximately 25.4/xmm [(1/x) inch], and the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

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
	On	40	64	Paper is being fed by the paper feed button
5	Off	00	0	Cover is close
	On	20	32	Cover is open
4	On	10	16	Not used. Fixed to On
3	Off	00	0	On-line
	On	08	8	Off-line
2	Off	00	0	Drawer kick-out connector pin 3 is LOW
	On	04	4	Drawer kick-out connector pin 3 is HIGH
1	Off	00	0	Not used. Fixed to Off
0	Off	00	0	Not used. Fixed to Off

Second byte (printer information)

Bit	Off/On	Hex	Decimal	Function
7	Off	00	0	Not used. Fixed to Off
6	Off	00	0	Not used. Fixed to Off
5	Off	00	0	Not used. Fixed to Off
4	Off	00	0	Not used. Fixed to Off
3	On	08	8	Not used. Fixed to Off

2	On	04	4	Not used. Fixed to Off
1	On	02	2	Not used. Fixed to Off
0	On	01	1	Not used. Fixed to Off

Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Function
7	Off	00	0	Not used. Fixed to Off
6	Off	00	0	Not used. Fixed to Off
5	Off	00	0	Not used. Fixed to Off
4	On	00	0	Not used. Fixed to Off
2,3	Off	00	0	Paper end sensor: paper present
	On	0C	12	Paper end sensor: no paper present
0,1	Off	00	0	Paper near end sensor: paper adequate
	On	03	3	Paper near end sensor: paper near end

Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Function
7	Off	00	0	Not used. Fixed to Off
6	Off	00	0	Black mark sensor status
5	Off	00	0	Not used. Fixed to Off
4	Off	00	0	Not used. Fixed to Off
3	On	08	8	Not used. Fixed to On
2	On	04	4	Not used. Fixed to On
1	On	02	2	Not used. Fixed to On
0	On	01	1	Not used. Fixed to On

GS f n

[Name]	Select 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

<table>
<tr><td>[Name]</td><td>Print bar code.</td></tr>
<tr><td>[Format]</td><td>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</td></tr>
<tr><td>[Range]</td><td>1. 0 ≤ m ≤ 6 The definition region of k and d differ according to the bar code type.
2. 65 ≤ m ≤ 73 The definition region of n and d differ according to the bar code type.</td></tr>
<tr><td>[Description]</td><td>Selects the bar code type and prints bar codes.
1:
<table>
<tr><th>m</th><th>Barcode Type</th><th>Defined region of k</th><th>Defined region of d</th></tr>
<tr><td>0</td><td>UPC-A</td><td>11 ≤ k ≤ 12</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>1</td><td>UPC-E</td><td>11 ≤ k ≤ 12</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>2</td><td>JAN13 (EAN13)</td><td>12 ≤ k ≤ 13</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>3</td><td>JAN8 (EAN8)</td><td>7 ≤ k ≤ 8</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>4</td><td>CODE39</td><td>1 ≤ k ≤ 255</td><td>48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47</td></tr>
<tr><td>5</td><td>ITF</td><td>2 ≤ k ≤ 254 (However, This is an even number.)</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>6</td><td>CODABAR</td><td>1 ≤ k ≤ 255</td><td>48 ≤ d ≤ 57, 65 ≤ d ≤ 68, 36, 43, 45, 46, 47, 58</td></tr>
</table>
2:
<table>
<tr><th>m</th><th>Bar Code Type</th><th>Defined region of n</th><th>Defined region of d</th></tr>
<tr><td>65</td><td>UPC-A</td><td>11 ≤ n ≤ 12</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>66</td><td>UPC-E</td><td>11 ≤ n ≤ 12</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>67</td><td>JAN13 (EAN13)</td><td>12 ≤ n ≤ 13</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>68</td><td>JAN8 (EAN8)</td><td>7 ≤ n ≤ 8</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>69</td><td>CODE39</td><td>1 ≤ n ≤ 255</td><td>48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47</td></tr>
<tr><td>70</td><td>ITF</td><td>2 ≤ n ≤ 254 (However, this is an even number.)</td><td>48 ≤ d ≤ 57</td></tr>
<tr><td>71</td><td>CODABAR</td><td>1 ≤ n ≤ 255</td><td>48 ≤ d ≤ 57, 65 ≤ d ≤ 68, 36, 43, 45, 46, 47, 58</td></tr>
<tr><td>72</td><td>CODE93</td><td>1 ≤ n ≤ 255</td><td>0 ≤ d ≤ 127</td></tr>
<tr><td>73</td><td>CODE128</td><td>2 ≤ n ≤ 255</td><td>0 ≤ d ≤ 127</td></tr>
</table></td></tr>
</table>

GS r n

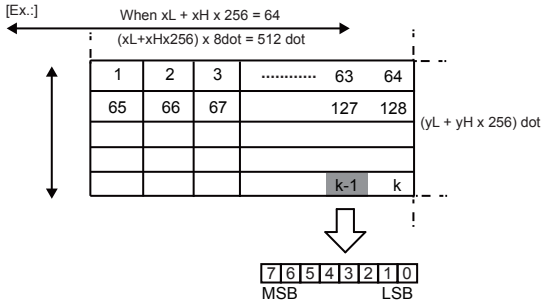
<table>
<tr><td>[Name]</td><td>Transmit status.</td></tr>
<tr><td>[Format]</td><td>ASCII GS r n
Hex. 1D 72 n
Decimal 29 114 n</td></tr>
<tr><td>[Range]</td><td>n = 1, 2, 49, 50</td></tr>
<tr><td>[Description]</td><td>Sends the specified status.
Detector Status (n=1,49)
<table>
<tr><th>Bit</th><th>Status</th><th>“0”</th><th>“1”</th></tr>
<tr><td>7</td><td>Fixed at 0</td><td></td><td></td></tr>
<tr><td>6</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>5</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>4</td><td>Fixed at 0</td><td></td><td></td></tr>
<tr><td>3</td><td>Paper roll end detector</td><td>Has Paper</td><td>Paper out</td></tr>
<tr><td>2</td><td>Paper roll end detector</td><td>Has Paper</td><td>Paper out</td></tr>
<tr><td>1</td><td>Paper roll near end detector</td><td>Has Paper</td><td>Paper out</td></tr>
<tr><td>0</td><td>Paper roll near end detector</td><td>Has Paper</td><td>Paper out</td></tr>
</table>
Drawer Kick Connector Status (n=2,50)
<table>
<tr><th>Bit</th><th>Status</th><th>“0”</th><th>“1”</th></tr>
<tr><td>7</td><td>Fixed at 0</td><td></td><td></td></tr>
<tr><td>6</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>5</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>4</td><td>Fixed at 0</td><td></td><td></td></tr>
<tr><td>3</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>2</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>1</td><td>Undefined</td><td></td><td></td></tr>
<tr><td>0</td><td>Drawer kick connector pin #3</td><td>“L”</td><td>“H”</td></tr>
</table></td></tr>
</table>

GS v 0 m xL xH yL yH d1 ... dk

[Name]	Print raster bit image.
[Format]	ASCII GS v 0 m xL xH yL yH d1...dk 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.



GS w n

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

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

<table>
<tr><td>[Name]</td><td>QR Code Print</td></tr>
<tr><td>[Format]</td><td>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]</td></tr>
<tr><td>[Range]</td><td>model=01, 02
e=4Ch, 4Dh, 51h, 48h
0, 1 ≤ v ≤ 40
mode=4Eh, 41h, 42h, 4Bh, 4Dh
1≤ nh×256+nl≤ 7089</td></tr>
<tr><td>[Description]</td><td>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 ≤ v ≤ 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.</td></tr>
</table>

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.

3.11 API

3.11.1 API Package Content

You can find the enclosed API Package files in the Protech Manual / Driver DVD. 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
	i-Button	IButtonAPI.dll IBFS32.dll	Driver to get i-Button
	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

3.11.2 API Procedure

Take **VB2005 .NET** for example, first you must declare a function. You may create a module in your project and fill in the function, cash drawer for example.

```
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
```

Next, create a button to call API Function

1. 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
   ```
2. 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

```
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:

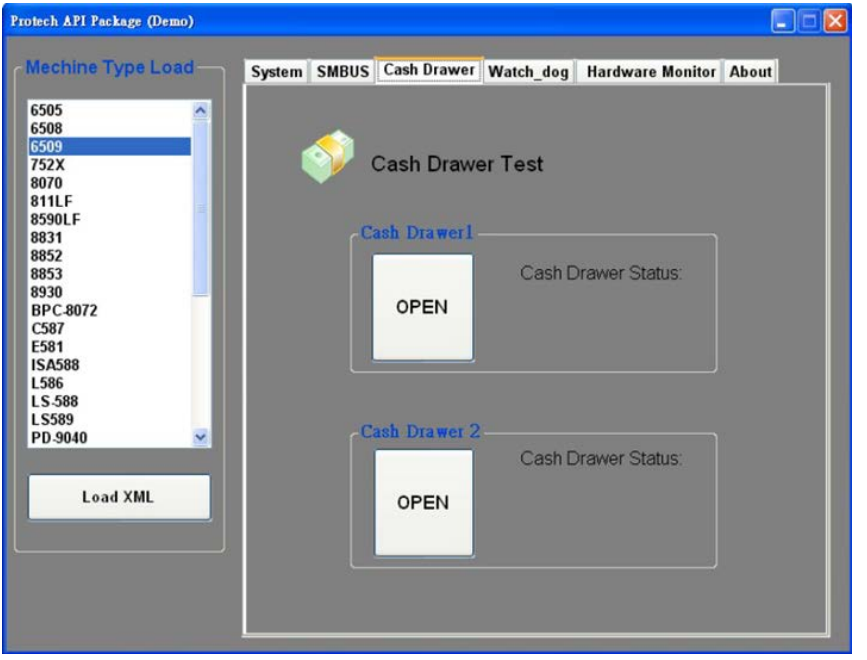
```
Declare Function SetMinSec Lib “WatchDog.dll” (ByVal kind As Short,ByVal
delay_time As Short) As Boolean
Declare Function Stopwatchdog Lib “WatchDog.dll” ( ) As Short
Declare Function Setwatchdog Lib “WatchDog.dll” (ByVal value As Short) As
Boolean
‘=====================================
Declare Function 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
```

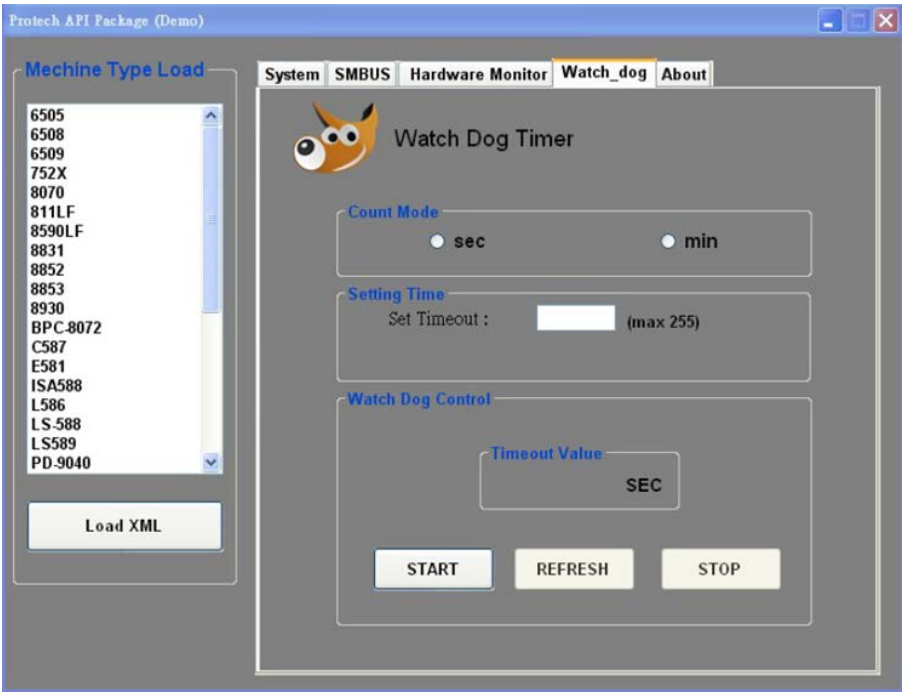
Note: VB.net short = integer VB6

3.11.3 Cash Drawer



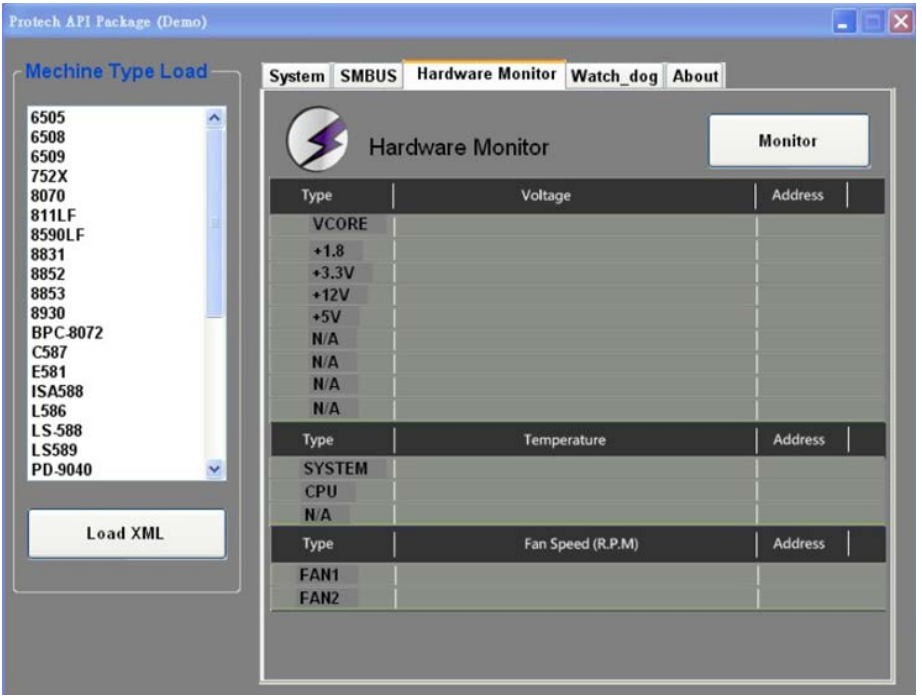
Button/Item	Description
OPEN (button)	Tap to open the cash drawer.
Cash Drawer Status	Cash drawer status will be displayed after **OPEN** is tapped. • Cash Drawer is closed when the following picture is shown: Cash Drawer Status: **Close** • Cash Drawer is opened when the following picture is shown: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

3.11.4 Watchdog Timer



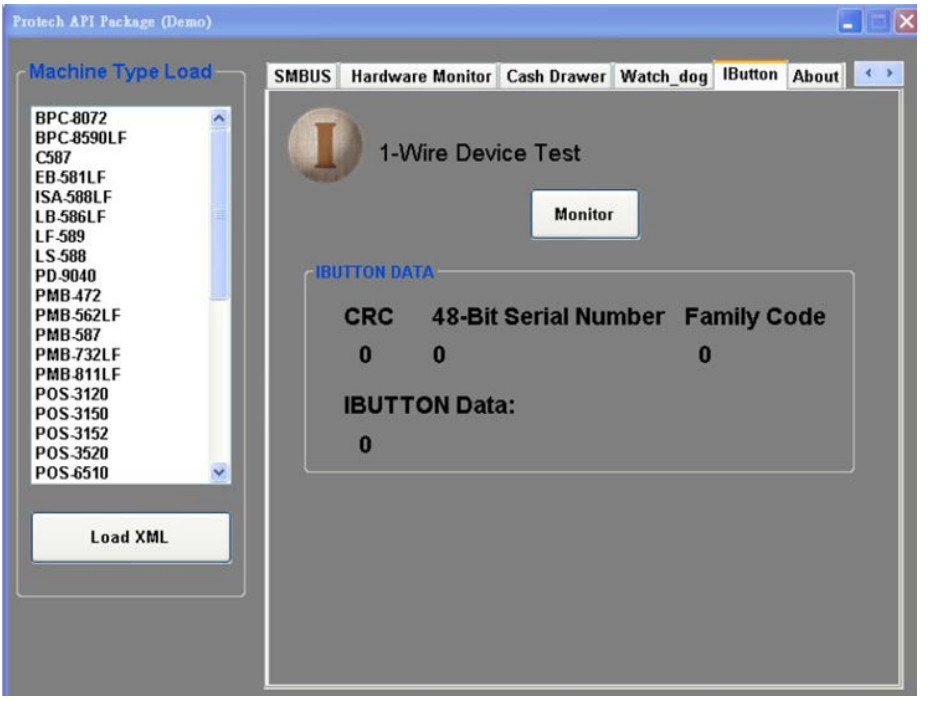
Button/Item	Description
Count Mode (radio button)	Select the unit of time, second or minute for the watchdog timer.
Setting Time	Set the timeout for the watchdog timer. (Maximum value: 255 seconds or minutes)
Watch Dog Control	• **Timeout Value**: Simulation timer of the API program. The running watchdog 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.

3.11.5 Hardware Monitor



Button/Item	Description
Monitor	Tap to get the hardware monitoring values, such as the voltages, temperatures, and fan speeds (rpm).

3.11.6 I-Button



Button/Item	Description
Monitor	Tap to get the i-Button data that will be displayed below the IBUTTON DATA field.

3.12 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)	Watchdog_Set Watchdog_Stop Watchdog_SetMinSec Watchdog_Recount		WatchDog.dll
Hardware Monitor	HMWVoltage_Get HWMtTemperature_Get HWMFanSpeed_Get		Hardware Montior.dll

3.12.1 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
```

3.12.2 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

3.12.3 Hardware Monitor Function

HMWVoltage_Get

float HMWVoltage_Get (short VoltType)

Purpose: Get the hardware monitoring voltage value.

Value

VoltType	W83627HF	W83627EHF	SMSC3114	W83627UHG
0x01	VCoreA	CPU VCore	N/A	VCore
0x02	VCoreB	VIN0	+1.5V	VIN0
0x03	+3.3VIN	AVCC	N/A	AVCC
0x04	+5VIN	+3VCC	+5VIN	5VCC
0x05	+12VIN	VIN1	+12V	VIN1
0x06	-12VIN	VIN2	N/A	VIN2
0x07	-5VIN	VIN3	N/A	N/A
VoltType	81866			
0x01	VCore			
0x02	VCC12			
0x03	VCC5			
0x04	5VSB			
0x05	N/A			
0x06	N/A			
0x07	N/A			

Return: Float type data on voltage value

HMWTemperature_Get

float HMWTemperature_Get (short TempType)

Purpose: Get the hardware monitoring temperature value.

Value

TempType	W83627HF	W83627EHF	SMSC3114	W83627UHG
0x01	CPU temperature	System temperature	CPU temperature	CPU temperature
0x02	N/A	CPU2 temperature	N/A	N/A
0x03	N/A	N/A	N/A	N/A
TempType	81866			
0x01	CPU temperature			
0x02	System temperature			
0x03	N/A			

Return: Float type data on temperature value

HMWFanSpeed_Get

float HMWFanSpeed_Get (short FanType)

Purpose: Get the hardware monitoring fan speed value.

Value

FanType	W83627HF	W83627EHF	SMSC3114	W83627UHG
0x01	Fan1	SysFanIN	FAN1	FAN1
0x02	Fan2	CPUFANIN	FAN2	FAN2
0x03	N/A	AUXFANIN	N/A	N/A
FanType	81866			
0x01	Fan1			
0x02	Fan2			
0x03	N/A			

Return: Float type data on fan speed value (rpm)

3.12.4 I-Button Function

Decode_Ibutton_Process

bool Decode_Ibutton_Process(short[] buffer);

Purpose: Get the i-Button data.
Value Buffer = i-Button read will sent to this buffer
Return: True (1) on success, False (0) on failure

4 BIOS SETUP

This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in battery-backed BIOS NVRAM so that the Setup information is retained when the system power is off. The BIOS Setup Utilities consist of the following menu items:

- Main Menu
- Advanced Menu
- Chipset Menu
- Security Menu
- Boot Menu
- Save & Exit Menu

4.1 Introduction

The system PA-J670 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.

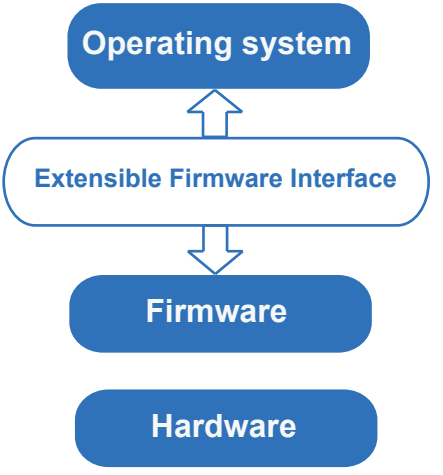


Figure 4-1. Extensible Firmware Interface Diagram

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.

4.2 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 4-2. 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:

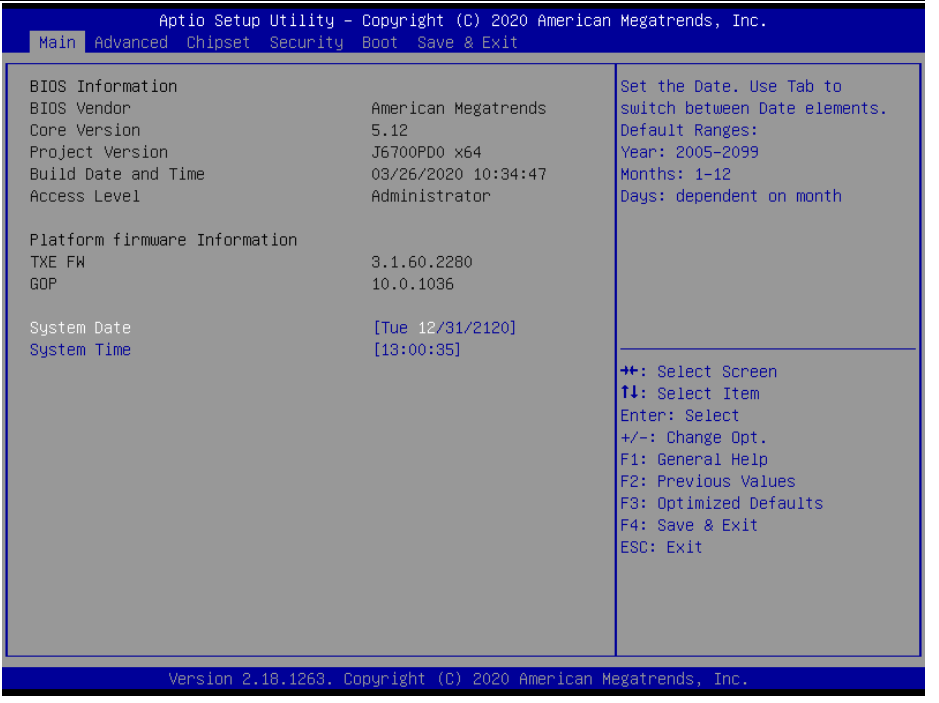


Figure 4-3. BIOS Setup Menu Initialization Screen

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.

4.3 Main

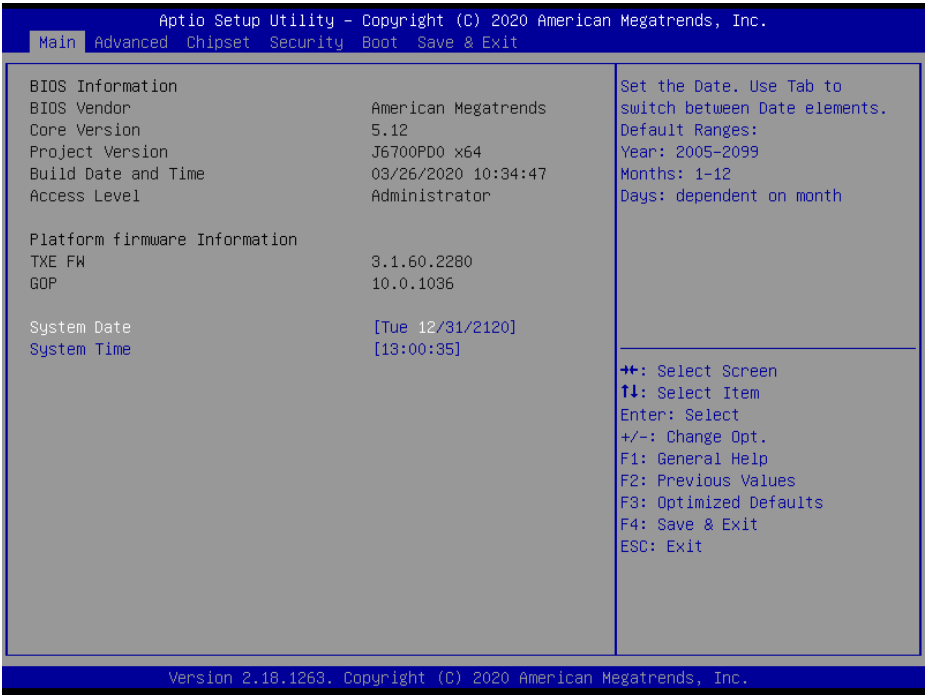


Figure 4-4. BIOS Main Menu

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.
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.
Access Level	No changeable options	Displays the Access Level.
TXE FW	No changeable options	Displays the TXE firmware version.
GOP	No changeable options	Displays the GOP driver version.
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.

4.4 Advanced

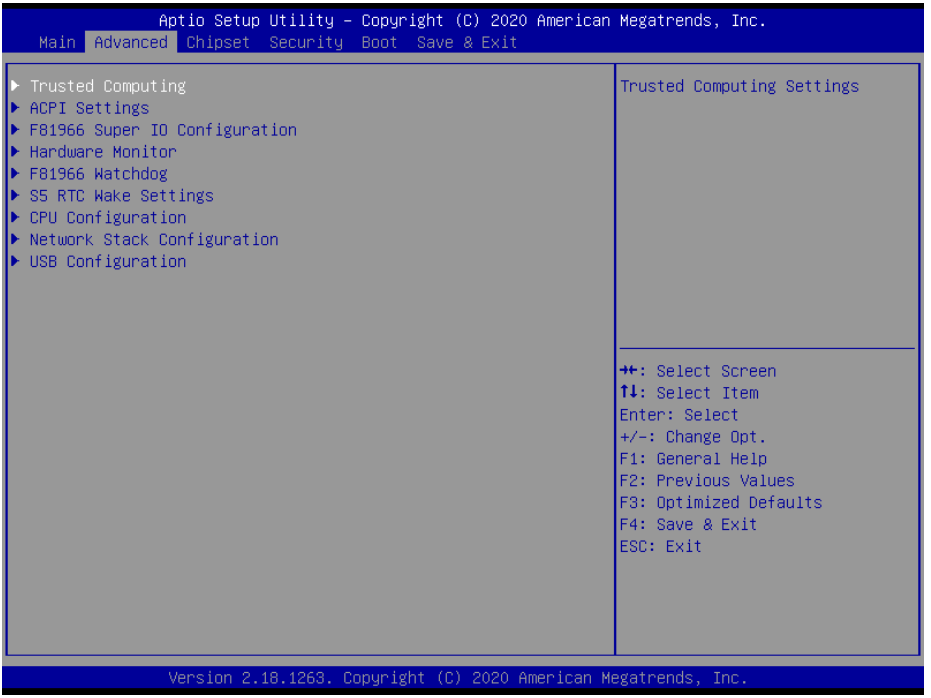


Figure 4-5. BIOS Advanced Menu

BIOS Setting	Options	Description/Purpose
Trusted Computing	Sub Menu	Trusted Computing Settings.
ACPI Settings	Sub Menu	System ACPI Parameters.
F81966 Super IO Configuration	Sub Menu	System Super I/O Chip parameters.
Hardware Monitor	Sub Menu	Monitor hardware status
F81966 Watchdog	Sub Menu	F81966 Watchdog parameters
S5 RTC Wake Settings	Sub Menu	Enables system to wake from S5 using RTC alarm.
CPU Configuration	Sub Menu	CPU Configuration Parameters.
Network Stack Configuration	Sub Menu	Network Stack Settings.
USB Configuration	Sub Menu	USB Configuration Parameters.

4.4.1 Trusted Computing

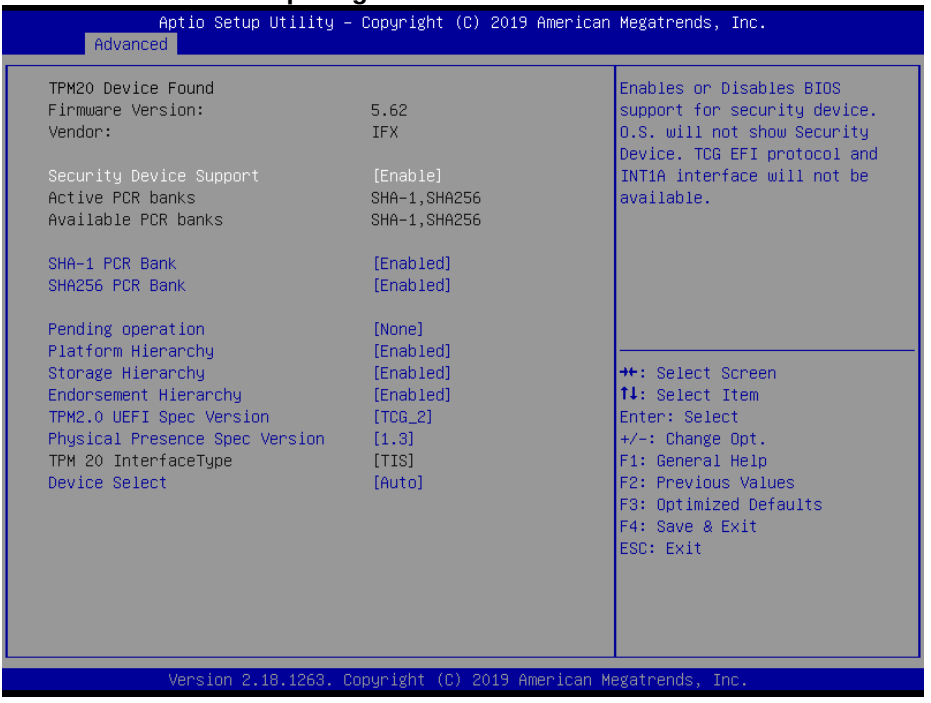


Figure 4-6. Trusted Computing Screen

BIOS Setting	Options	Description/Purpose
Security Device Support	- Disabled - Enabled **(Default)**	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Active PCR banks	SHA-1, SHA256	Displays the Security Device
Available PCR banks	SHA-1, SHA256	Displays the Security Device
SHA-1 PCR Bank	- Disabled - Enabled **(Default)**	Enables or Disables SHA-1 PCR Bank
SHA256 PCR Bank	- Disabled - Enabled **(Default)**	Enables or Disables SHA256 PCR Bank
Pending operation	- None **(Default)** - TPM Clear	Schedules an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	- Disabled - Enabled **(Default)**	Enables or Disables Platform Hierarchy
Storage Hierarchy	- Disabled - Enabled **(Default)**	Enables or Disables Storage Hierarchy

BIOS Setting	Options	Description/Purpose
Endorsement Hierarchy	- Disabled - Enabled **(Default)**	Enables or Disables Endorsement Hierarchy
TPM2.0 UEFI Spec Version	- TCG_1_2 - TCG_2 **(Default)**	Selects the TCG2 Spec Version Support. • **TCG_1_2:** The compatible mode for Win8/Win10. • **TCG_2:** Supports new TCG2 protocol and event format for Win10 or later.
Physical Presence Spec Version	- 1.2 - 1.3 **(Default)**	Selects to tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
TPM 20 InterfaceType	TIS	Display TPM 20 InterfaceType.
Device Select	- TPM 1.2 - TPM 2.0 - Auto **(Default)**	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated

4.4.2 ACPI Settings

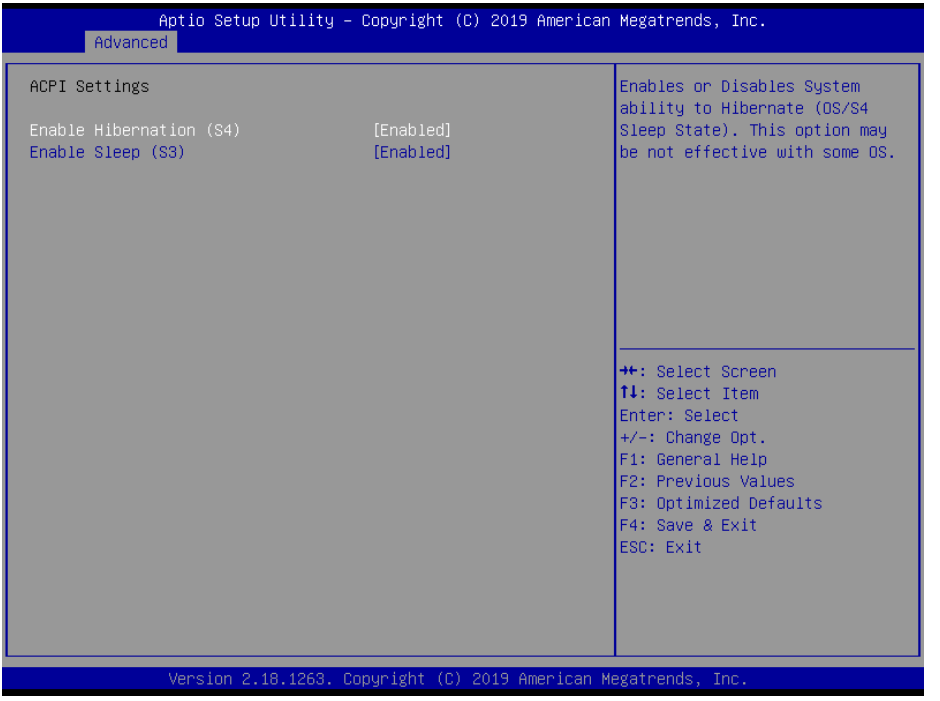


Figure 4-7. ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable Hibernation (S4)	- Disabled - Enabled **(Default)**	Enables or disables the system's ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OSes.
Enable Sleep (S3)	- Disabled - Enabled **(Default)**	Enables or Disables System ability to Sleep (OS/S3 Sleep State.)

4.4.3 F81966 Super IO Configuration

Select **F81966 Super IO Configuration** from the **Advanced** menu and press **Enter** to configure the serial ports 1-4.

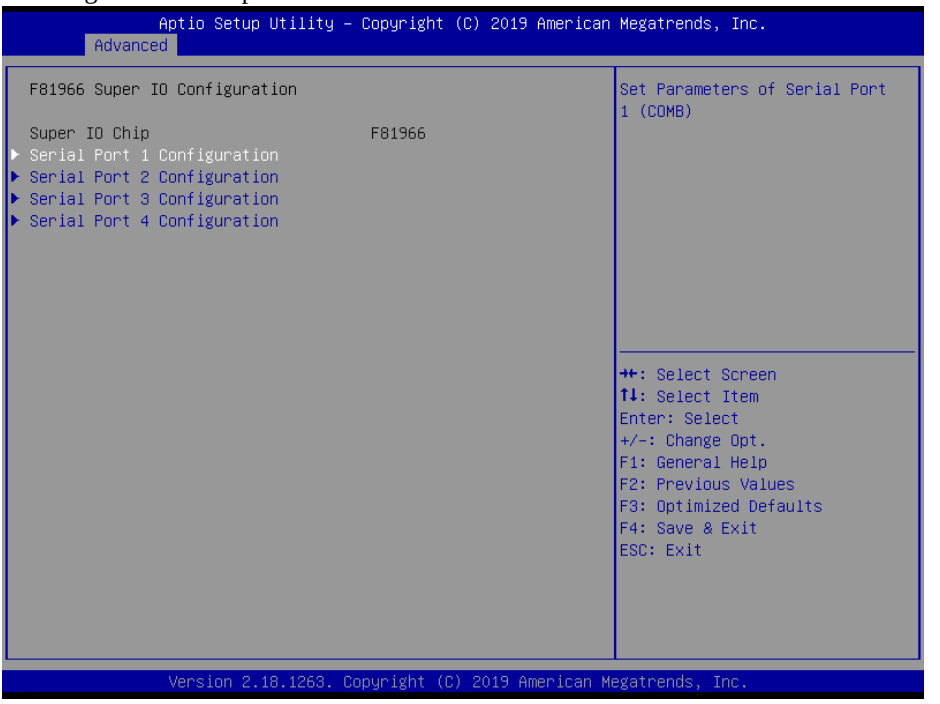


Figure 4-8. F81966 Super IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub Menu	Configures the parameters of Serial Port 1 (COMB).
Serial Port 2 Configuration	Sub Menu	Configures the parameters of Serial Port 2 (COMC).
Serial Port 3 Configuration	Sub Menu	Configures the parameters of Serial Port 3 (COMA).
Serial Port 4 Configuration	Sub Menu	Configures the parameters of Serial Port 4 (COMD).

4.4.3.1 Serial Port 1 Configuration

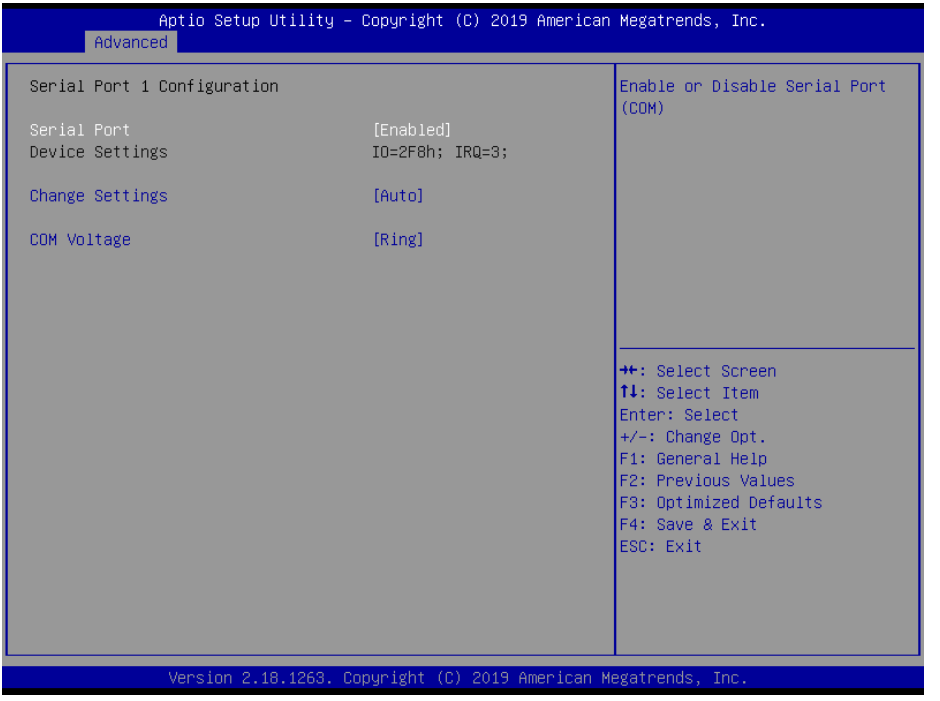


Figure 4-9. Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled **(Default)**	Enables or Disables Serial Port (COM).
Device Settings	No changeable options	Displays the current settings of Serial Port 1.
Change Settings	- Auto **(Default)** - 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;	Allows users to change the device resource settings. New settings will be reflected on this setup page after system restarts.
COM Voltage	- Ring **(Default)** - 12V - 5V	COM Voltage Selection

4.4.3.2 Serial Port 2 Configuration

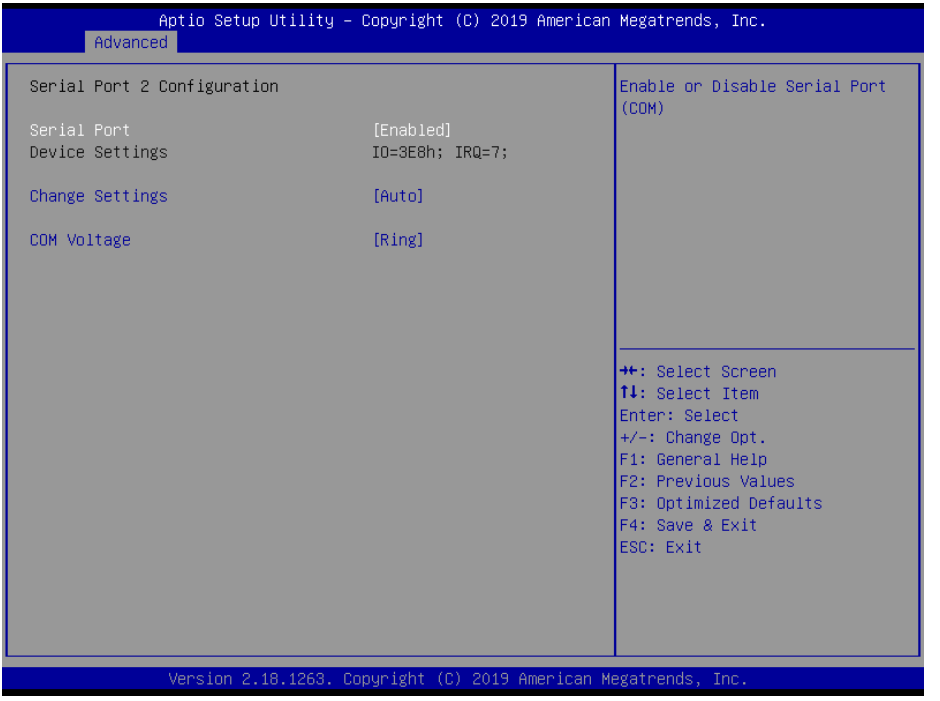


Figure 4-10. Serial Port 2 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled **(Default)**	Enables or Disables this Logical Device.
Device Settings	No changeable options	Displays the current settings of Serial Port 2.
Change Settings	- Auto **(Default)** - 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;	Allows users to change the device resource settings. New settings will be reflected on this setup page after system restarts.
COM Voltage	- Ring **(Default)** - 12V - 5V	COM Voltage Selection

4.4.3.3 Serial Port 3 Configuration

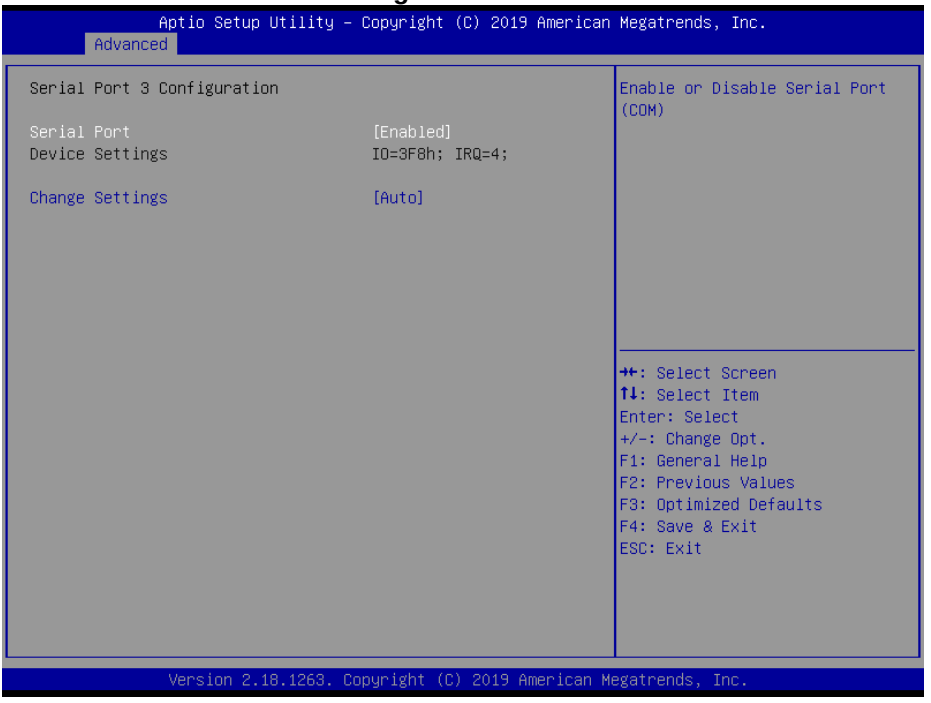


Figure 4-11. Serial Port 3 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled **(Default)**	Enables or Disables this Logical Device.
Device Settings	No changeable options	Displays the current settings of Serial Port 3.
Change Settings	- Auto **(Default)** - 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;	Allows users to change the device resource settings. New settings will be reflected on this setup page after system restarts.

4.4.3.4 Serial Port 4 Configuration

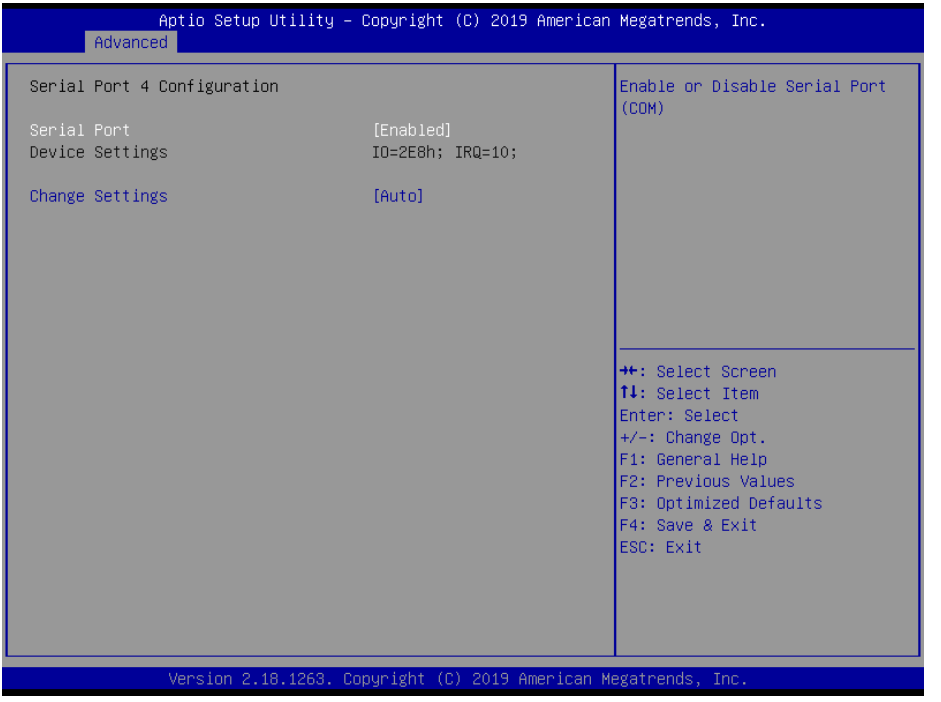


Figure 4-12. Serial Port 4 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled **(Default)**	Enables or Disables this Logical Device.
Device Settings	No changeable options	Displays the current settings of Serial Port 4.
Change Settings	- Auto **(Default)** - IO=2E8h; IRQ=10 - IO=3F8h; 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;	Allows users to change the device resource settings. New settings will be reflected on this setup page after system restarts.

4.4.4 Hardware Monitor

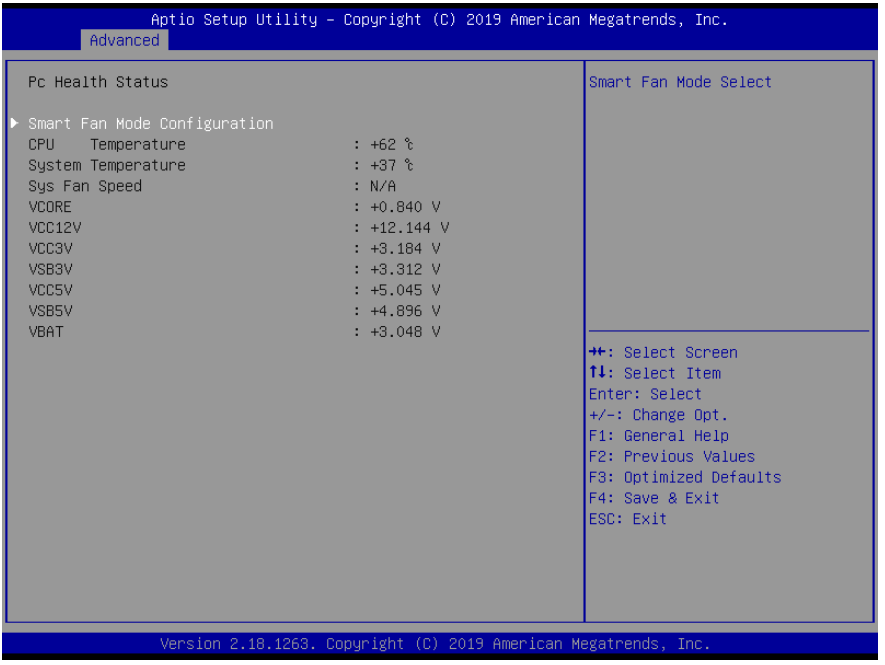


Figure 4-13. Hardware Monitor Screen

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	Sub Menu	Smart Fan Mode Selection.
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system's temperature.
Sys Fan Speed	No changeable options	Displays the system's speed.
VCORE	No changeable options	Displays the voltage level of VCORE in supply.
VCC12V	No changeable options	Displays the voltage level of VCC12V 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.
VCC5V	No changeable options	Displays the voltage level of VCC5V in supply.
VSB5V	No changeable options	Displays the voltage level of VSB5V in supply.
VBAT	No changeable options	Displays the voltage level of VBAT in supply.

4.4.4.1 Hardware Monitor - Smart Fan Mode Configuration

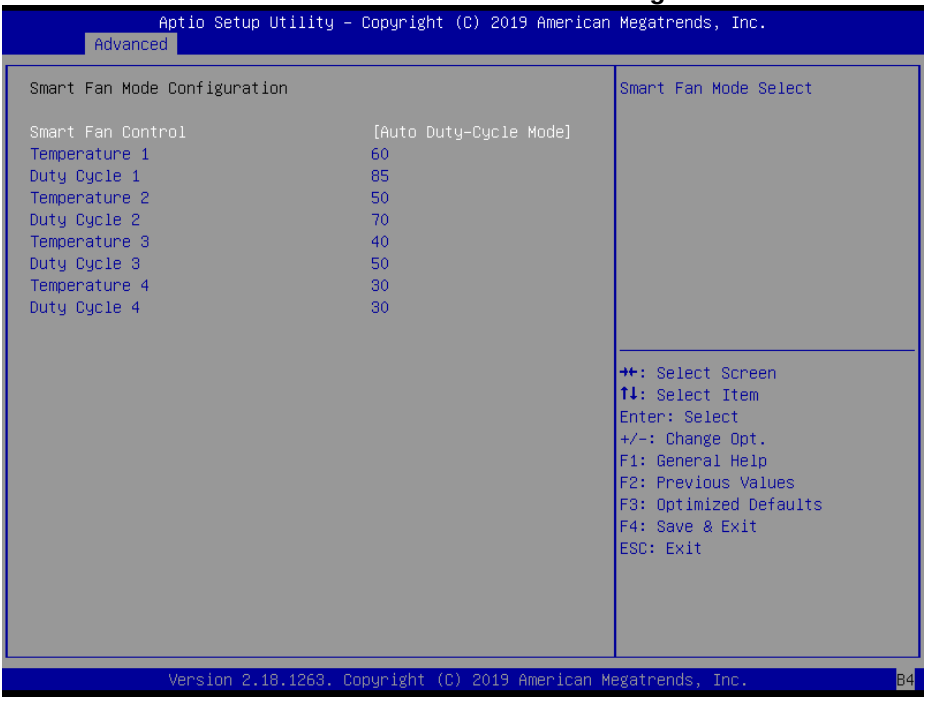


Figure 4-14. Smart Fan Mode Configuration Screen

BIOS Setting	Options	Description/Purpose
Smart Fan Control	- Manual Duty Mode - Auto Duty-Cycle Mode **(Default)**	Smart Fan Mode Selection.
Temperature 1	- Numeric - 60 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Duty Cycle 1	- Numeric - 85 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Temperature 2	- Numeric - 50 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Duty Cycle 2	- Numeric - 70 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Temperature 3	- Numeric - 40 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.

BIOS Setting	Options	Description/Purpose
Duty Cycle 3	- Numeric - 50 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Temperature 4	- Numeric - 30 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.
Duty Cycle 4	- Numeric - 30 **(Default)**	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100.

4.4.5 F81966 Watchdog

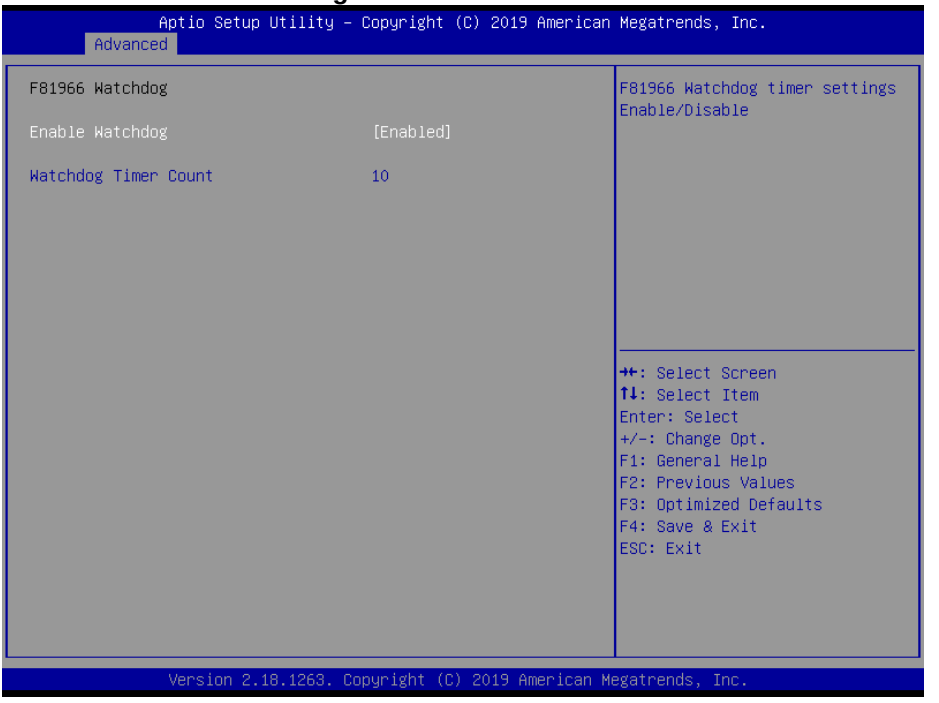


Figure 4-15. F81966 Watchdog Screen

BIOS Setting	Options	Description/Purpose
Enable WatchDog	- Enabled **(Default)** - Disabled	Enables/Disables F81966 Watchdog timer settings.
Watchdog Timer Count	- Numeric - 10 **(Default)**	Selects count of watchdog timer. Watchdog Timer = 1sec * Count

4.4.6 S5 RTC Wake Setting

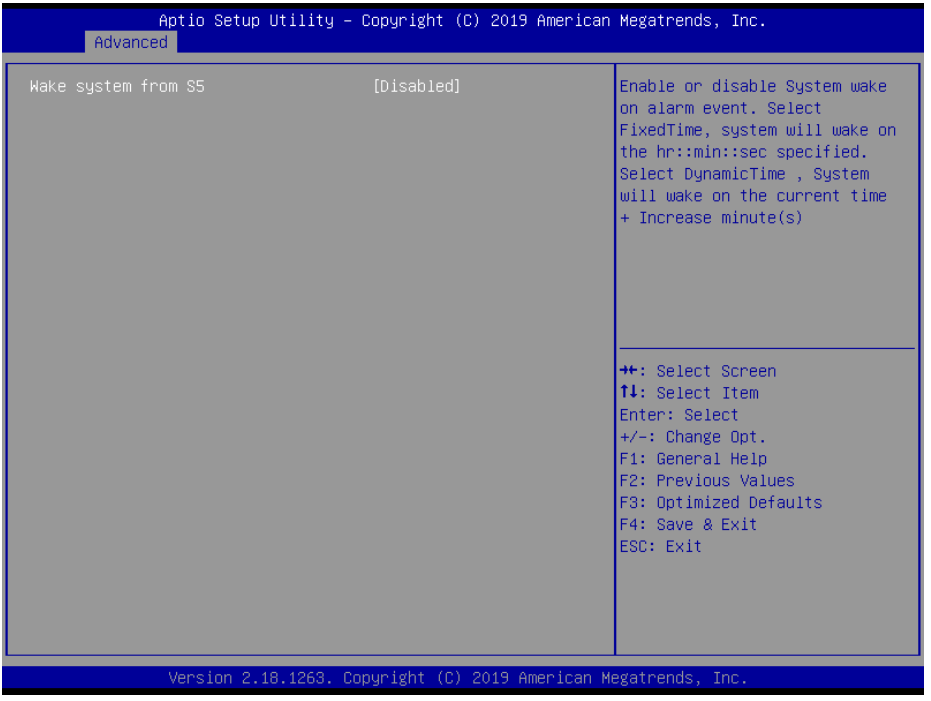


Figure 4-16. S5 RTC Wake Setting Screen

BIOS Setting	Options	Description/Purpose
Wake system from S5	- Disabled **(Default)** - Fixed Time - Dynamic Time	Enables or disables System wake on alarm event. • **Fixed Time:** system will wake on the hr:min:sec specified. • **Dynamic Time:** System will wake on the current time + Increased minute(s)

4.4.6.1 S5 RTC Wake Setting- Fixed Time

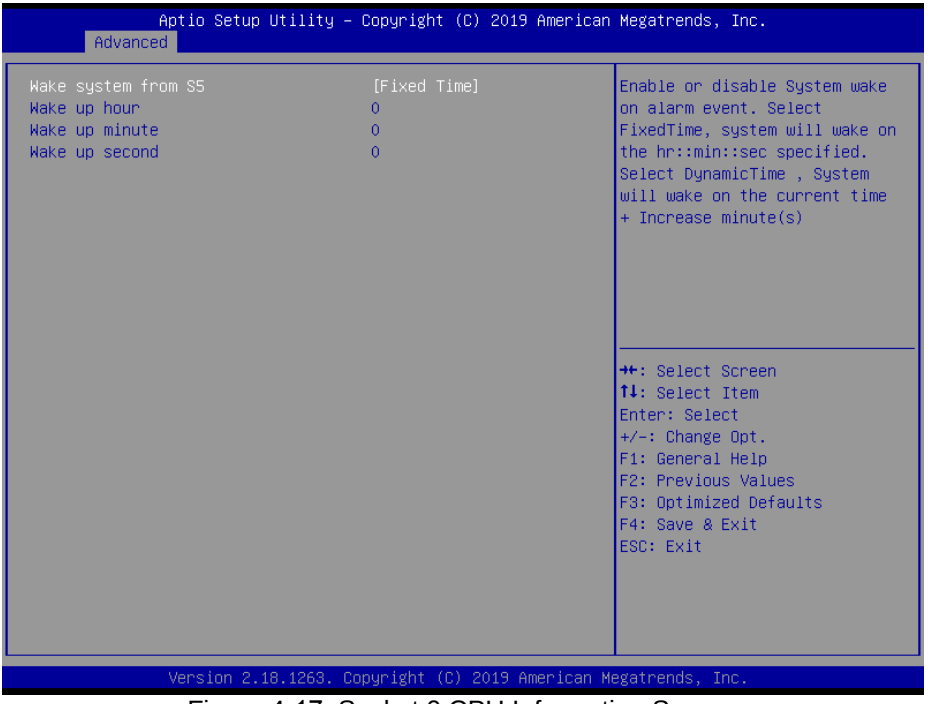


Figure 4-17. Socket 0 CPU Information Screen

BIOS Setting	Options	Description/Purpose
Wake up hour	Numeric	Selects 0-23. For example, enter 3 for 3 am and 15 for 3pm.
Wake up minute	Numeric	Selects 0-59 for Minute.
Wake up second	Numeric	Selects 0-59 for Second.

4.4.6.2 S5 RTC Wake Setting- Dynamic Time

Figure 4-18. S5 RTC Wake Setting Screen – Dynamic Time

BIOS Setting	Options	Description/Purpose
Wake up minute increase	Numeric	Selects 1 – 5.

4.4.7 CPU Configuration

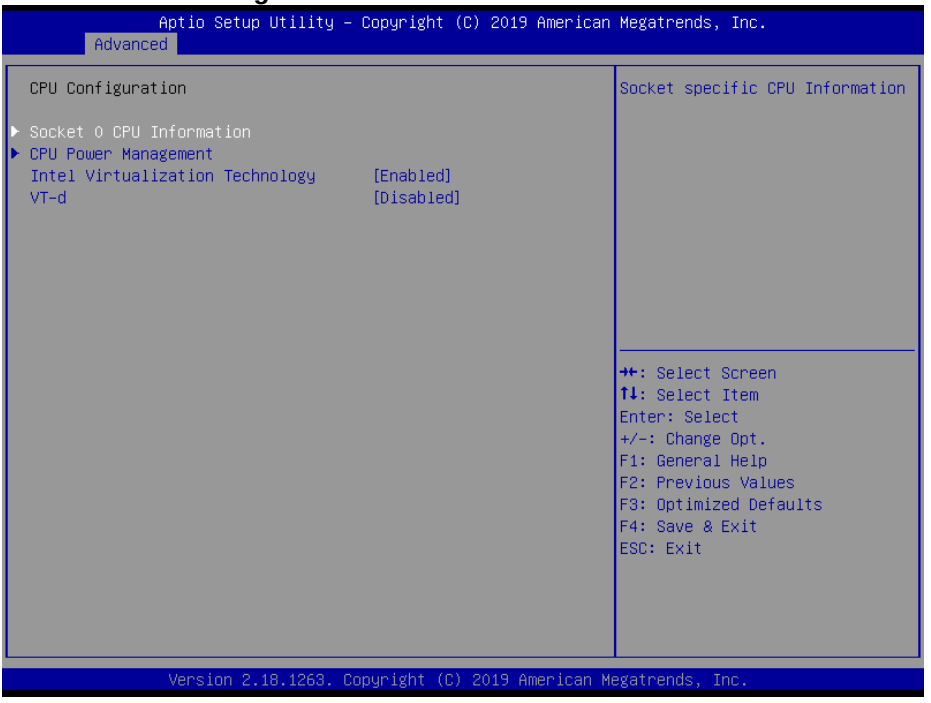


Figure 4-19. CPU Configuration Screen

BIOS Setting	Options	Description/Purpose
Socket 0 CPU Information	Sub Menu	Socket specific CPU Information
CPU Power Management	Sub Menu	CPU Power Management options
Intel Virtualization Technology	- Disabled - Enabled **(Default)**	When enabled, a VMM (Virtual Machine Monitor) can utilize the additional hardware capabilities provided by Vanderpool Technology (VT).
VT-d	- Disabled **(Default)** - Enabled	Enables or Disables VT-d function.

4.4.7.1 CPU Configuration - Socket 0 CPU Information

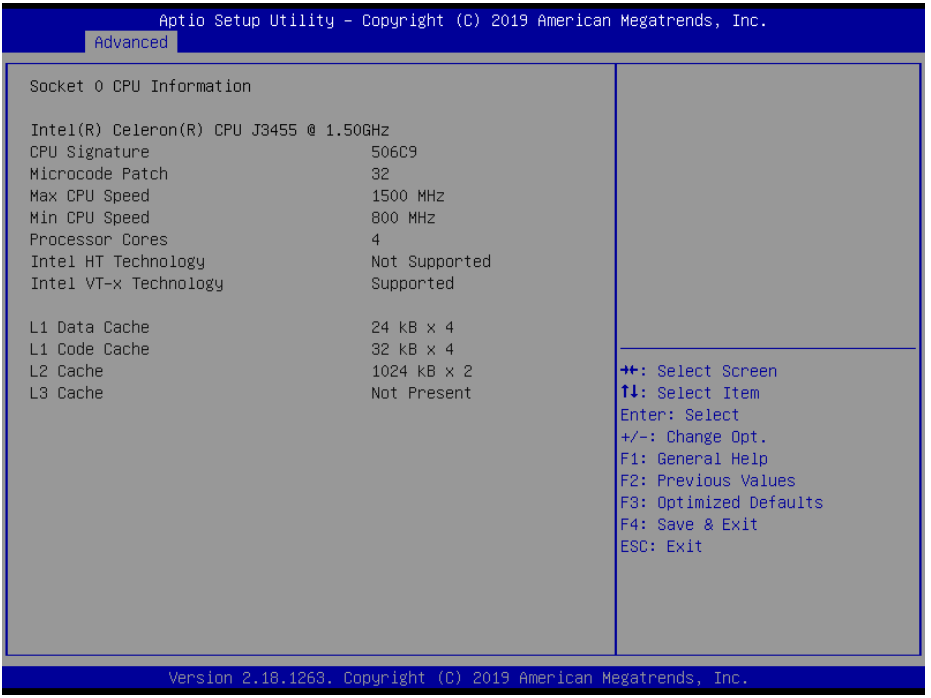


Figure 4-20. Socket 0 CPU Information Screen

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

4.4.7.2 CPU Configuration - CPU Power Management

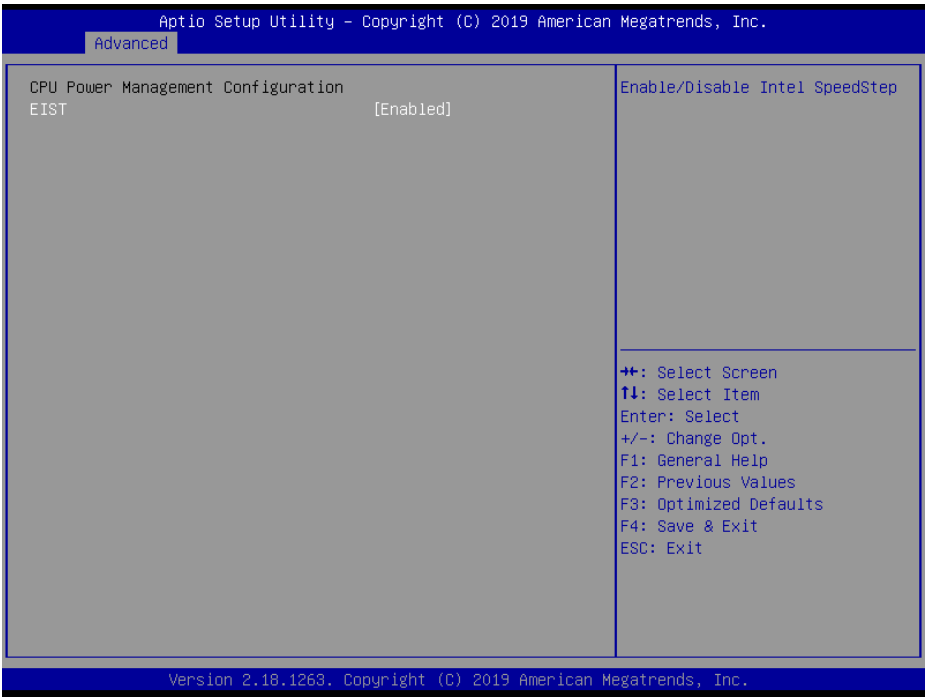


Figure 4-21. CPU Power Management Screen

BIOS Setting	Options	Description/Purpose
EIST	- Disabled - Enabled **(Default)**	Enables or Disables Intel SpeedStep.

4.4.8 Network Stack Configuration

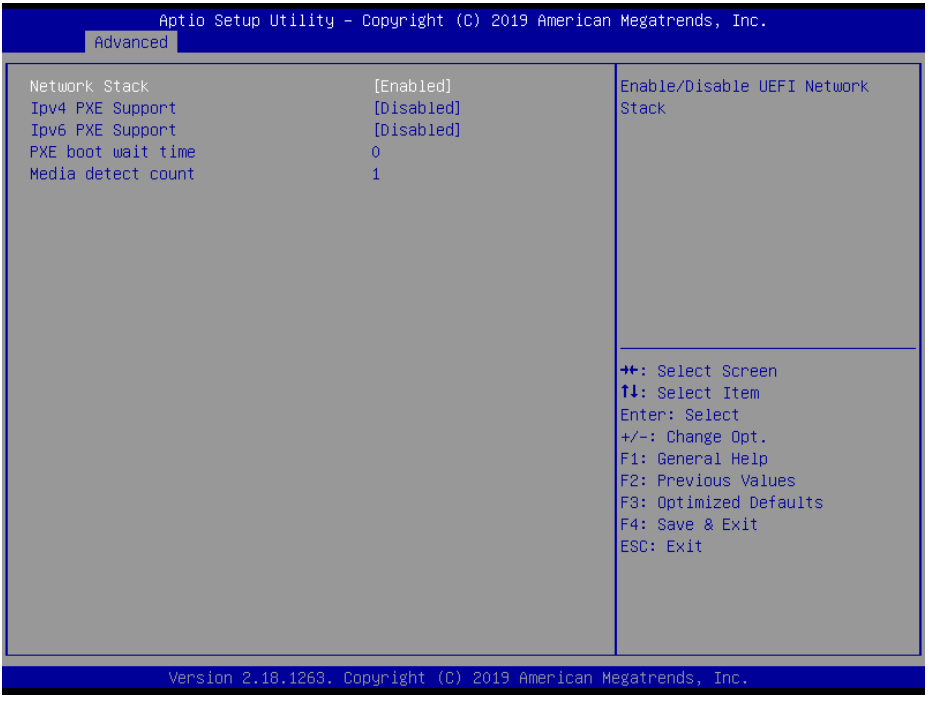


Figure 4-22. Network Stack Configuration Screen

BIOS Setting	Options	Description/Purpose
Network Stack	- Disabled - Enabled **(Default)**	Enables or Disables UEFI Network Stack.
Ipv4 PXE Support	- Disabled **(Default)** - Enabled	Enables Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Ipv6 PXE Support	- Disabled**(Default)** - Enabled	Enable Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
PXE boot wait time	Numeric (from 0 to 5)	Wait time to press ESC key to abort the PXE boot.
Media detect count	Numeric (from 1 to 50)	Numbers of times presence of media will be checked.

4.4.9 USB Configuration

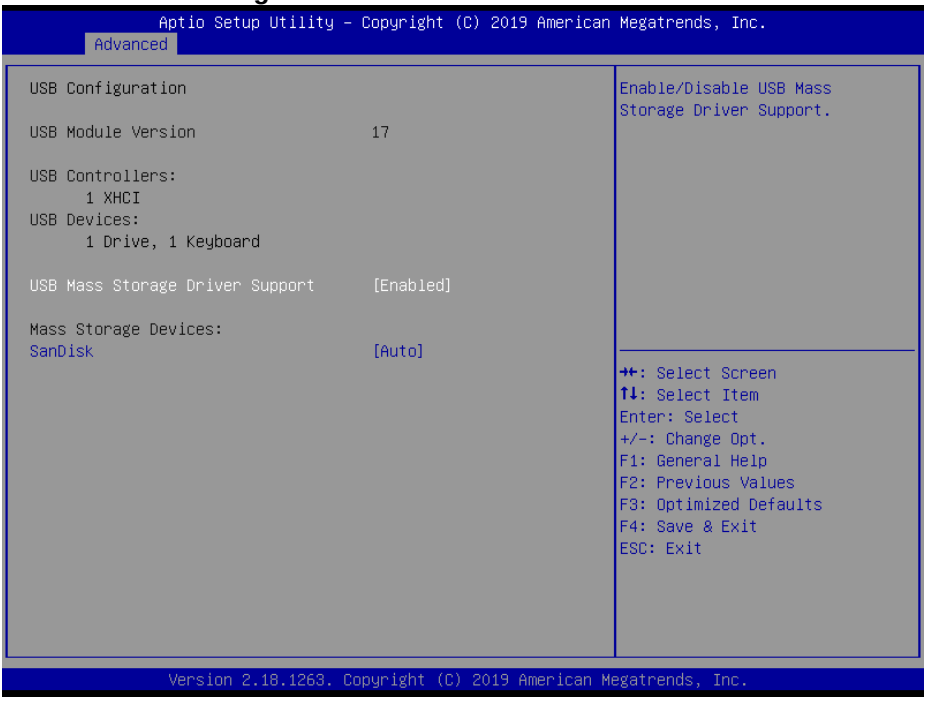


Figure 4-23. USB Configuration Screen

BIOS Setting	Options	Description/Purpose
USB Mass Storage Driver Support	- Disabled - Enabled **(Default)**	Enables or Disables USB Mass Storage Driver Support.

4.5 Chipset

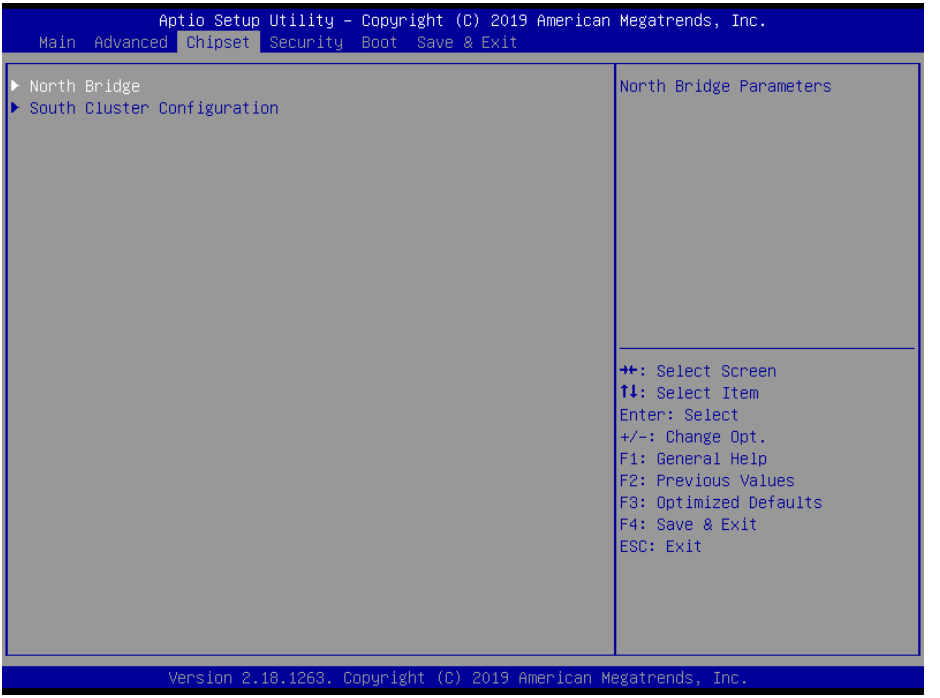


Figure 4-24. Chipset Menu Screen

BIOS Setting	Options	Description/Purpose
North Bridge	Sub Menu	North Bridge Parameters.
South Cluster Configuration	Sub Menu	South Cluster Configuration.

4.5.1 North Bridge

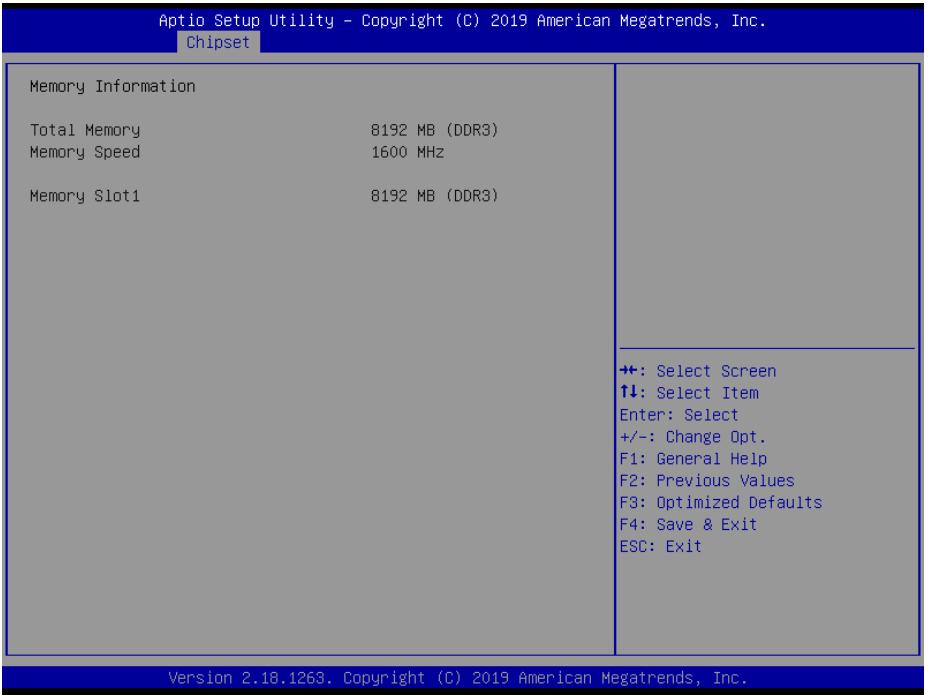


Figure 4-25. North Bridge Menu Screen

BIOS Setting	Options	Description/Purpose
Total Memory	No changeable options	Displays the Total Memory.
Memory Speed	No changeable options	Displays the speed of Memory.
Memory Slot1	No changeable options	Displays the size of Slot 1.

4.5.2 South Cluster Configuration

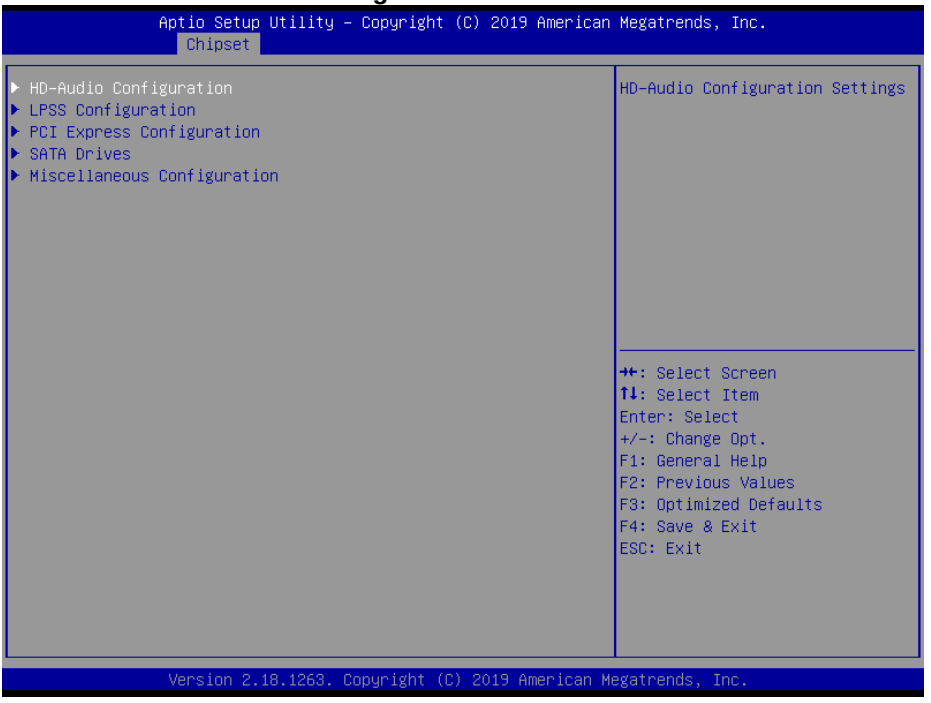


Figure 4-26. South Cluster Configuration Screen

BIOS Setting	Options	Description/Purpose
HD-Audio Configuration	Sub Menu	HD-Audio Configuration Settings
LPSS Configuration	Sub Menu	LPSS Configuration Settings.
PCI Express Configuration	Sub Menu	PCI Express Configuration Settings.
SATA Drives	Sub Menu	SATA Device Configuration Settings.
Miscellaneous Configurations	Sub Menu	Miscellaneous Configurations Settings.

4.5.2.1 South Cluster Configuration - HD-Audio Configuration

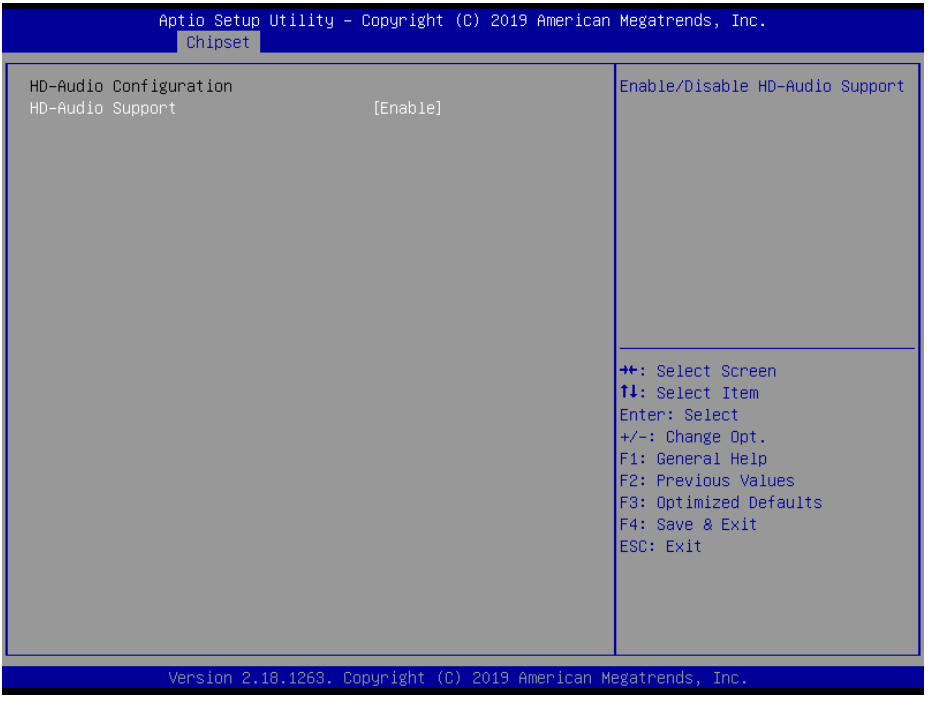


Figure 4-27. HD-Audio Configuration Screen

BIOS Setting	Options	Description/Purpose
HD-Audio Support	- Disabled - Enabled **(Default)**	Enables or Disables HD-Audio Support.

4.5.2.2 South Cluster Configuration - LPSS Configuration

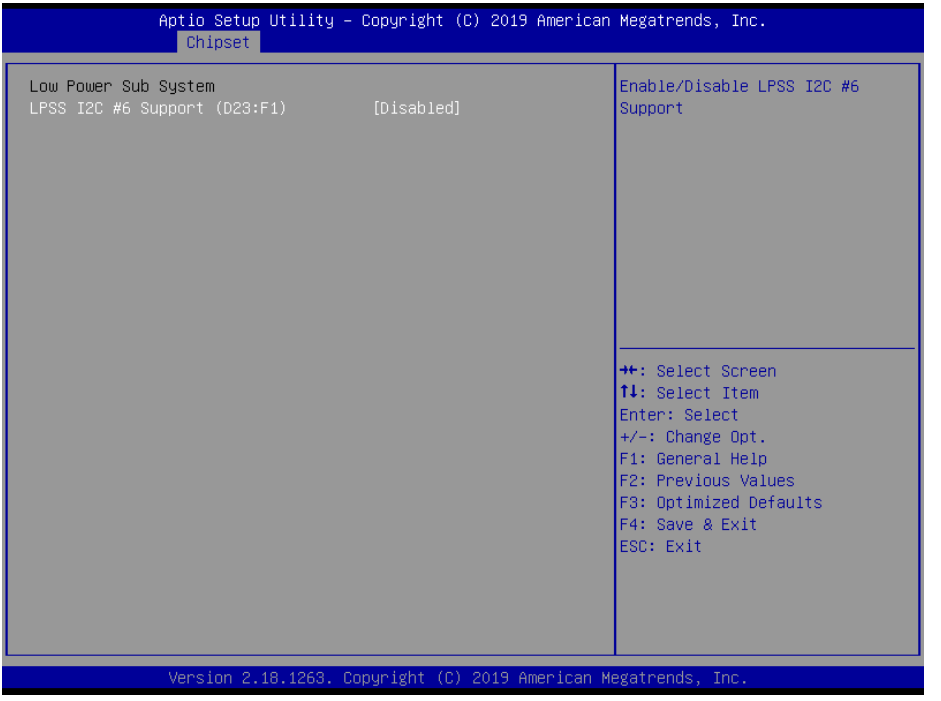


Figure 4-28. LPSS Configuration Screen

BIOS Setting	Options	Description/Purpose
LPSS I2C #6 Support (D23:F1)	- Disabled **(Default)** - Enabled	Enables or Disables LPSS I2C #6 Support.

South Cluster Configuration - LPSS Configuration - Enable

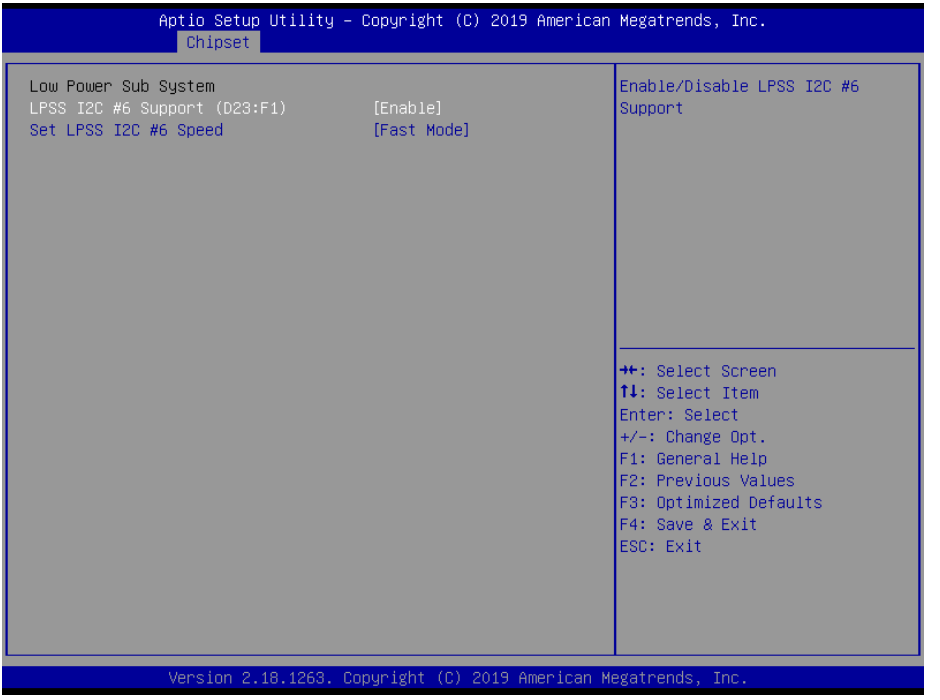


Figure 4-29. LPSS Configuration Screen (Enable)

BIOS Setting	Options	Description/Purpose
Set I2C2 Speed	- Standard Mode - Fast Mode **(Default)** - Fast Plus Mode - High Speed Mode	Selects LPSS I2C #6 Speed.

4.5.2.3 South Cluster Configuration - PCI Express Configuration

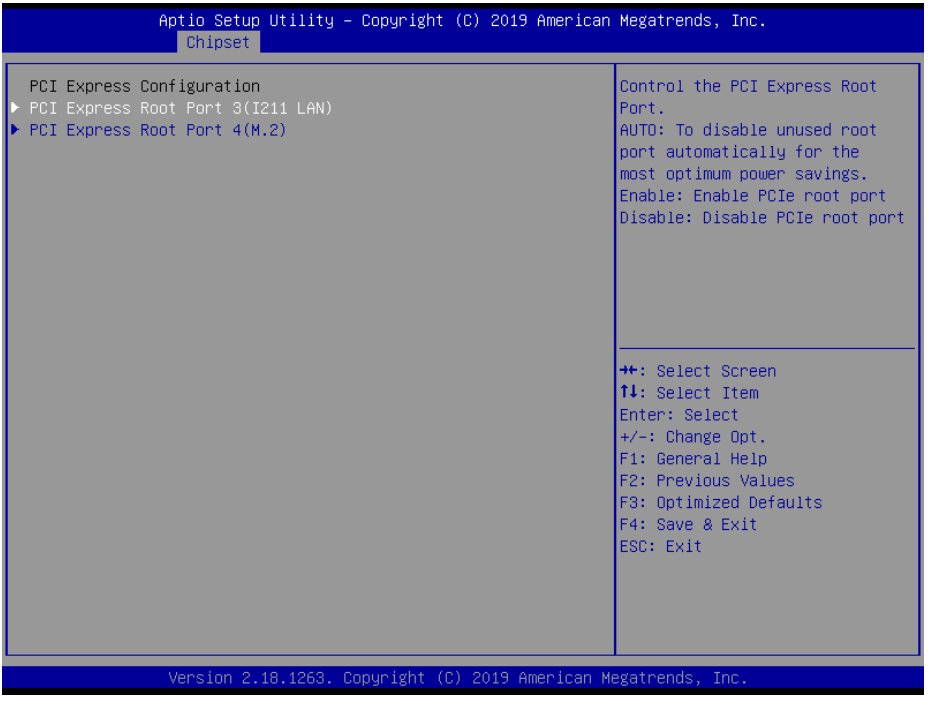


Figure 4-30. PCI Express Configuration Screen

BIOS Setting	Options	Description/Purpose
PCI Express Root Port 3 (I210 LAN)	Sub Menu	PCI Express Root Port 5 (I211 LAN) Settings.
PCI Express Root Port 4 (M.2)	Sub Menu	PCI Express Root Port 1 M.2) Settings.

South Cluster Configuration - PCI Express Configuration - PCI Express Root Port 3 (I211 LAN)

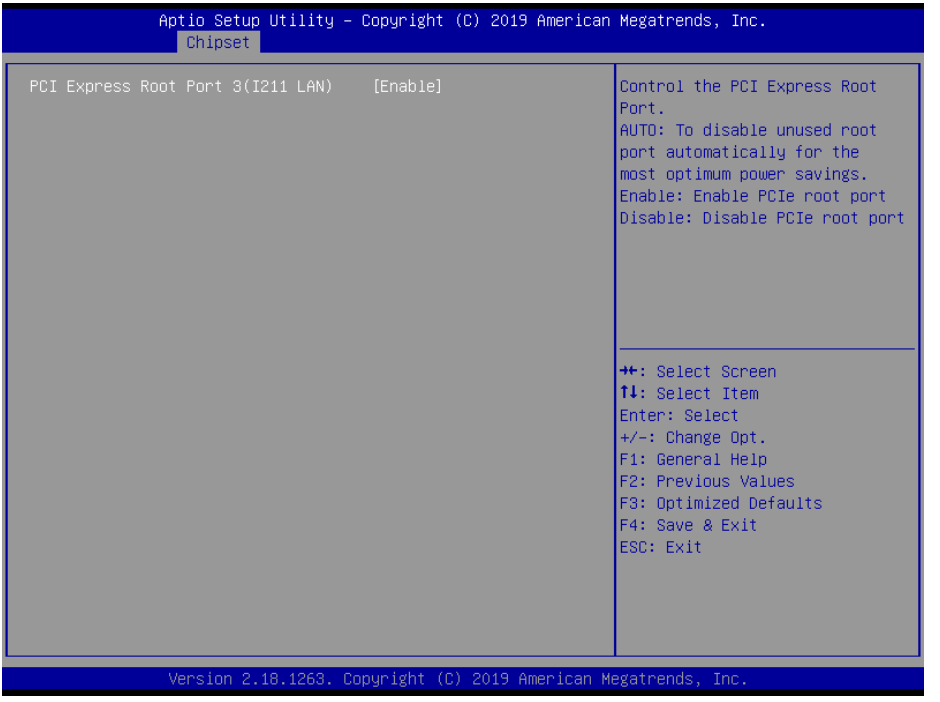


Figure 4-31. PCI Express Root Port 3 (I211 LAN) Configuration Screen

BIOS Setting	Options	Description/Purpose
PCI Express Root Port 3 (I211 LAN)	- Disable - Enable **(Default)** - Auto	Controls the PCI Express Root Port. • **Auto:** Disables unused root port automatically for the most optimum power savings. • **Enable:** Enables PCIe root port. • **Disable:** Disables PCIe root port.

South Cluster Configuration - PCI Express Configuration - PCI Express Root Port 4 (M.2)

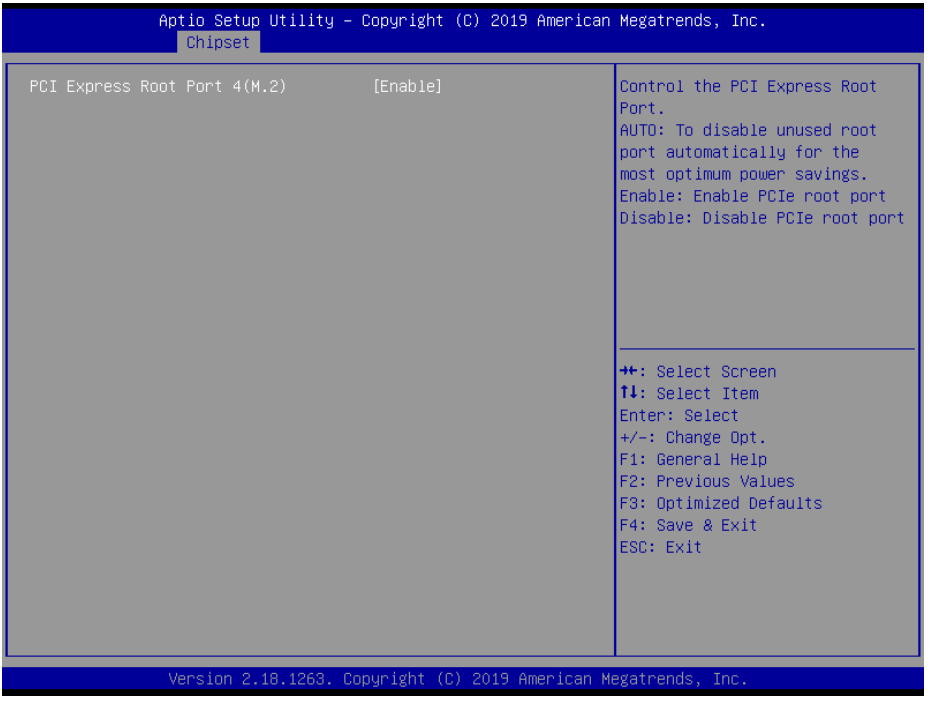


Figure 4-32. PCI Express Root Port 4 (M.2) Configuration Screen

BIOS Setting	Options	Description/Purpose
PCI Express Root Port 4 (M.2)	- Disable - Enable **(Default)** - Auto	Controls the PCI Express Root Port. • **Auto:** Disables unused root port automatically for the most optimum power savings. • **Enable:** Enables PCIe root port. • **Disable:** Disables PCIe root port.

4.5.2.4 South Cluster Configuration - SATA Drives

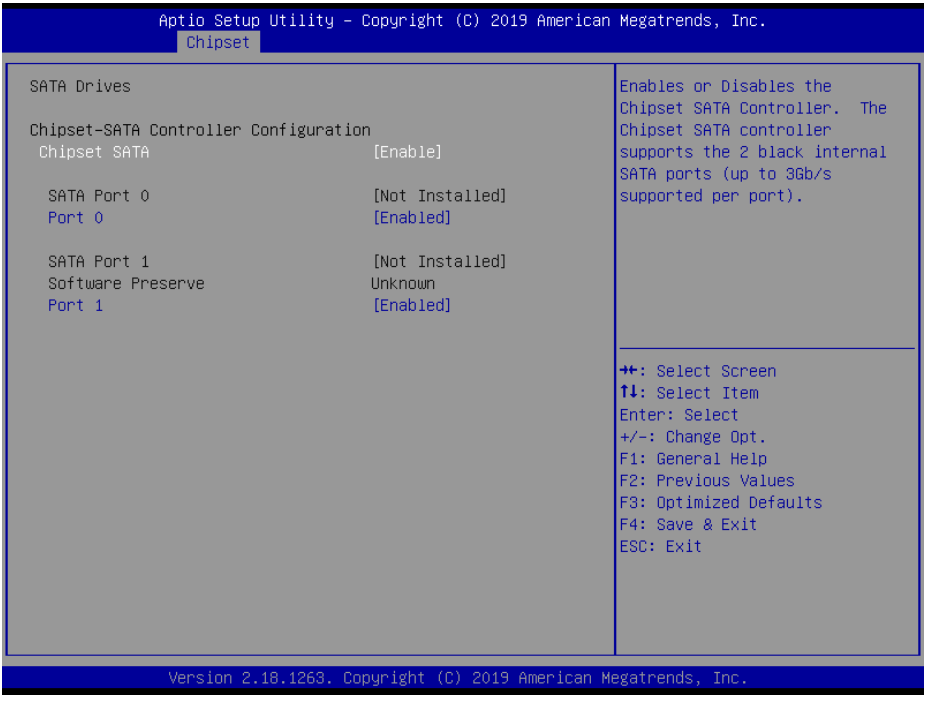


Figure 4-33. SATA Drives Screen

BIOS Setting	Options	Description/Purpose
Chipset SATA	- Disable - Enable **(Default)**	Enables or Disables the Chipset SATA Controller.
SATA Port 0	No changeable options	Displays the connected device on SATA Port 0
Port 0	- Disabled - Enabled **(Default)**	Enables or Disables SATA Port 0
SATA Port 1	No changeable options	Displays the connected device on SATA Port 1
Port 1	- Disabled - Enabled **(Default)**	Enables or Disables SATA Port 1

4.5.2.5 South Cluster Configuration - Miscellaneous Configuration

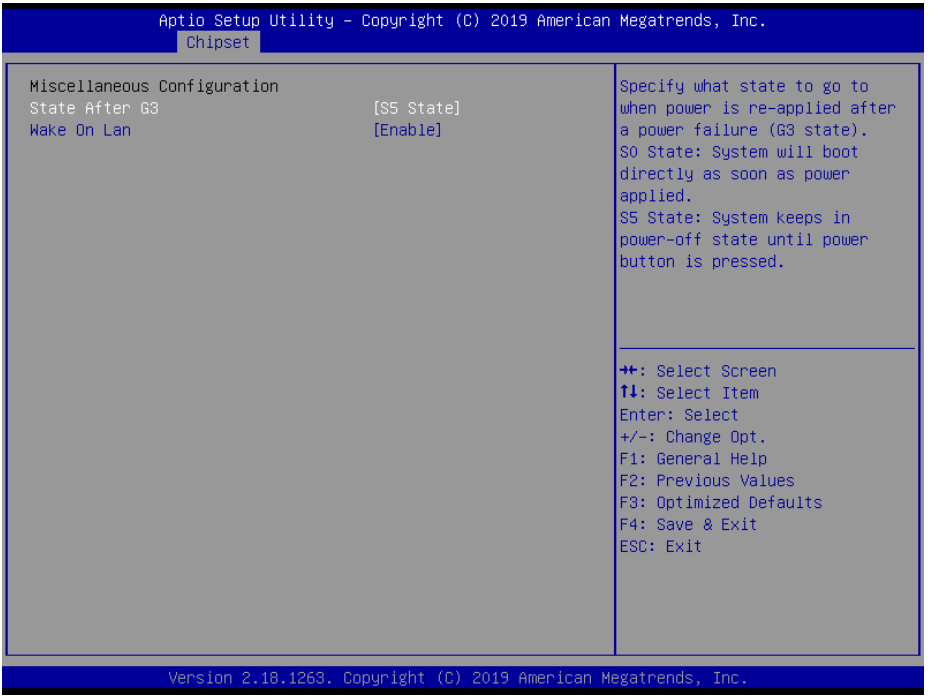


Figure 4-34. Miscellaneous Configuration Screen

BIOS Setting	Options	Description/Purpose
State After G3	- S0 State - S5 State **(Default)**	Specify what state to go to when power is re-applied after the power failure (G3 state) occurs. • **S0 State:** System will boot directly as soon as power is applied. • **S5 State:** System will remain at power-off state until the power button is pressed.
Wake On Lan	- Disable - Enable **(Default)**	Enables or Disables the Wake on Lan.

4.6 Security

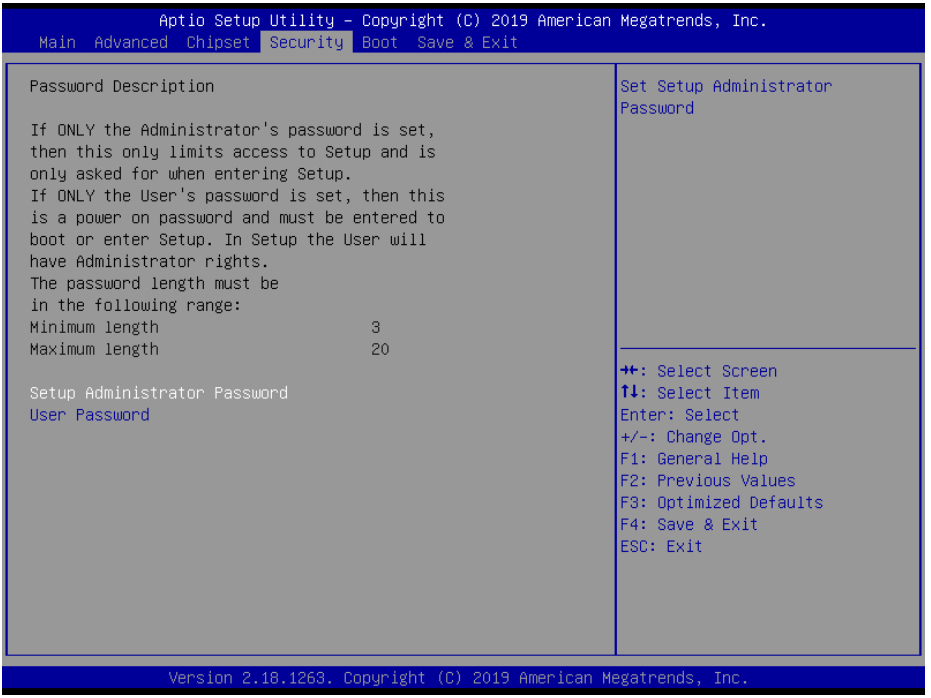


Figure 4-35. Security Menu Screen

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.

4.7 Boot

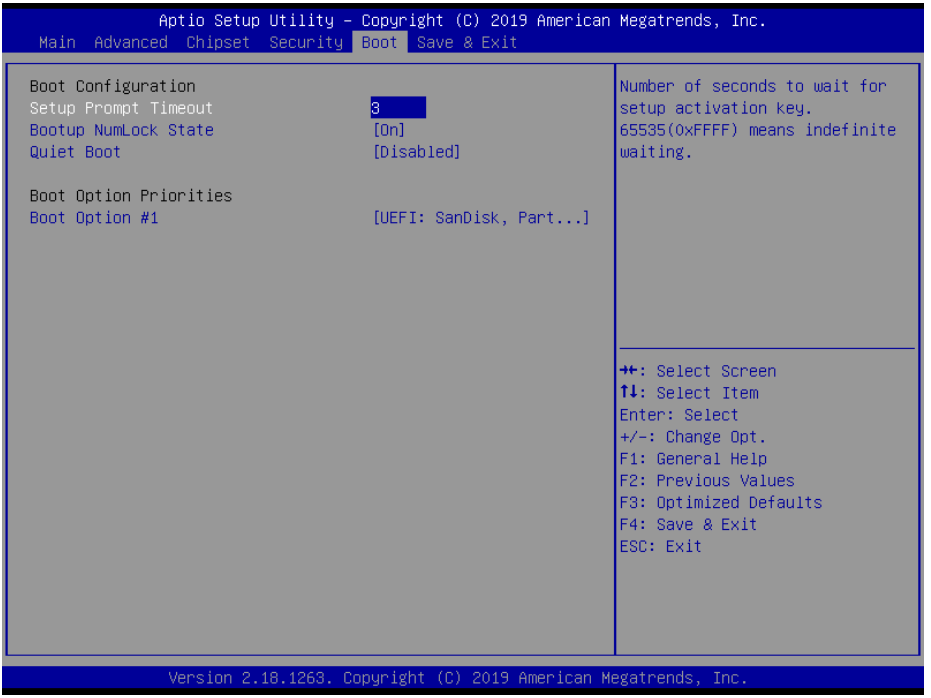


Figure 4-36. Boot Menu Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric (from 1 to 65535)	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On **(Default)** - Off	Specifies the power-on state of the NumLock Key.
Quiet Boot	- Disabled **(Default)** - Enabled	Enables or Disables Quiet Boot Options
Boot Option #1~#n	- [Drive(s)] - Disabled	Sets the system boot order.

4.8 Save & Exit

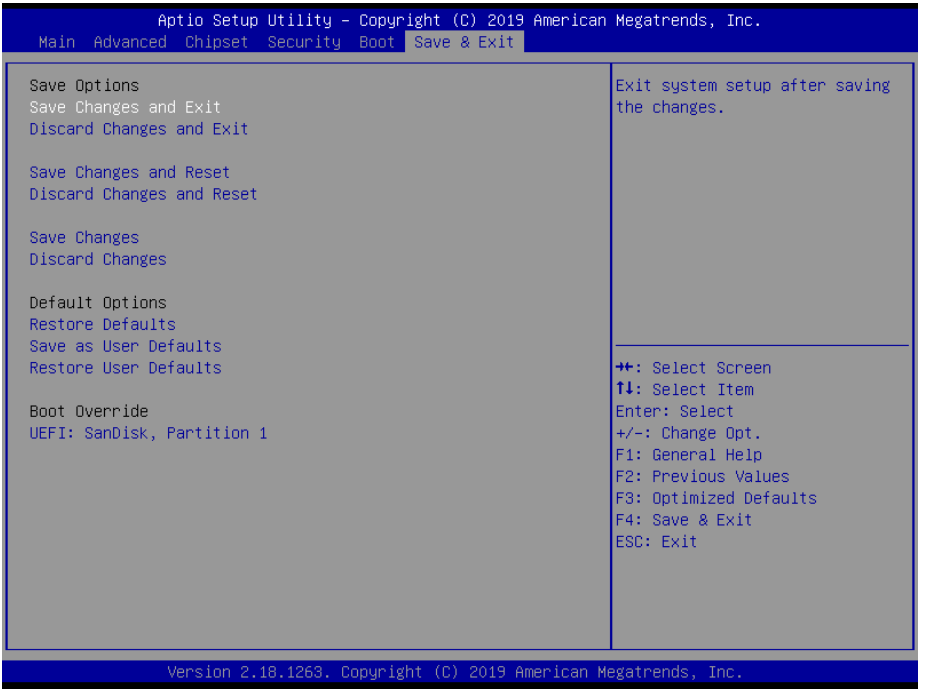


Figure 4-37. Save & Exit Menu Screen

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.
Save Changes	No changeable options	Saves Changes done so far to any of the setup options.
Discard Changes	No changeable options	Discards Changes done so far to any of the setup options.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Saves the changes done so far as User Defaults.
Restore User Defaults	No changeable options	Restores the User Defaults to all the setup options.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

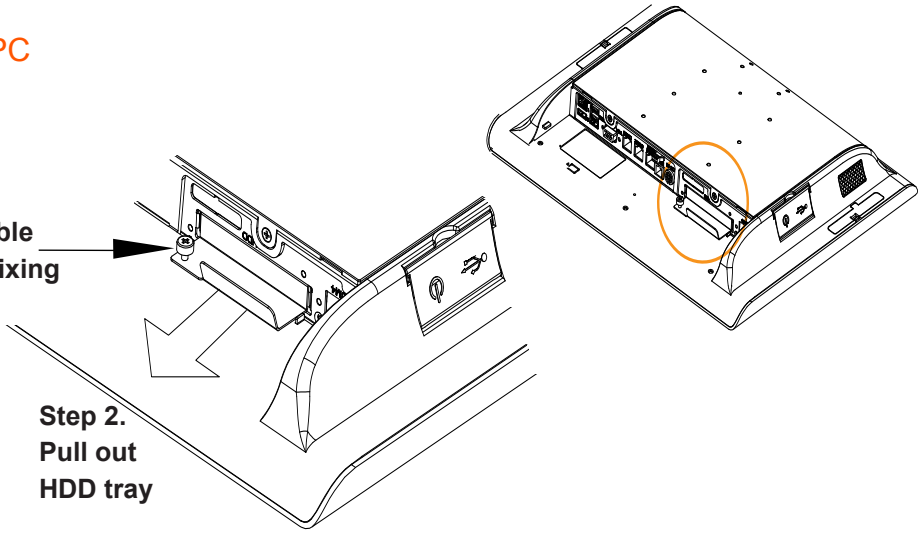
Appendix A System Diagrams

This appendix includes the easy maintenance diagrams, exploded diagrams and part numbers of PA-J670 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 Peripheral Devices
- Exploded Diagrams for Packing
- Exploded Diagrams for Spare Parts

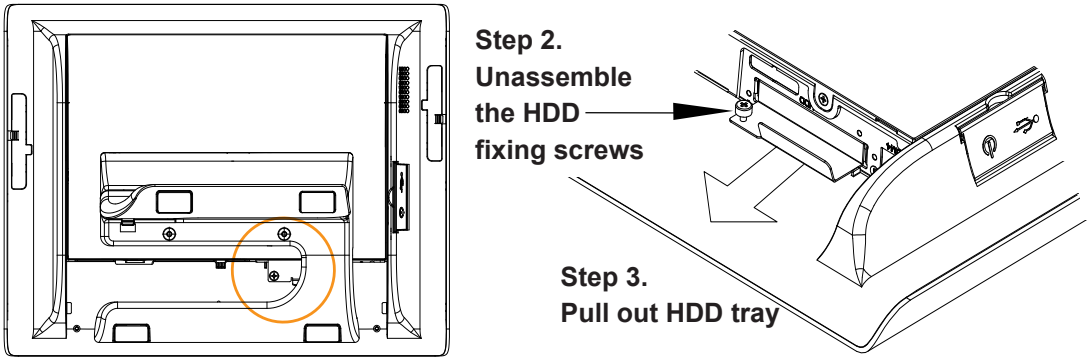
Easy Maintenance - HDD

Panel-PC

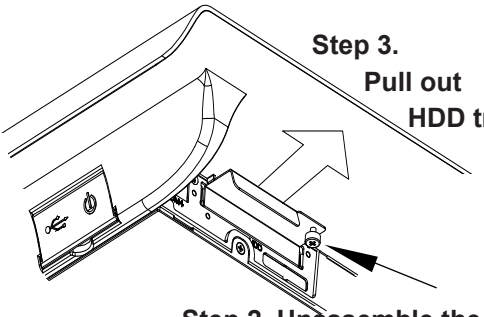


Easy Stand

Step 1. Lay down System on a flat as under drawing



Normal Stand

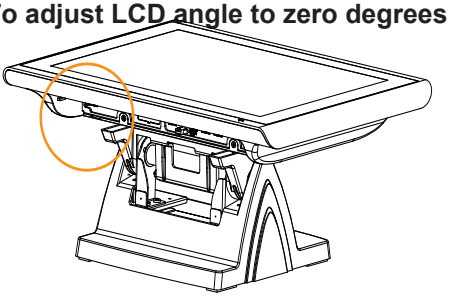


Step 3.
Pull out
HDD tray

Step 2. Unassemble the HDD fixing screws

Step 1.

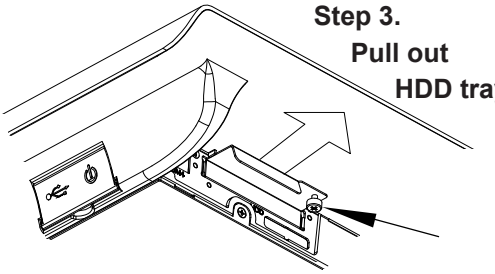
To adjust LCD angle to zero degrees



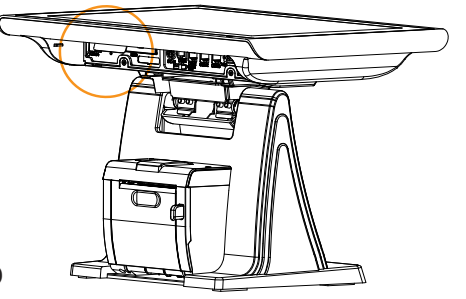
Printer Stand

Step 1.

To adjust LCD angle to zero degrees



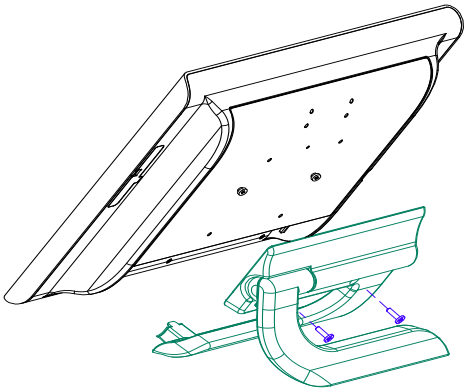
Step 3.
Pull out
HDD tray

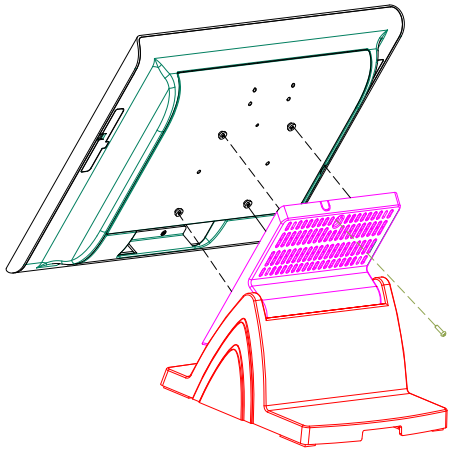


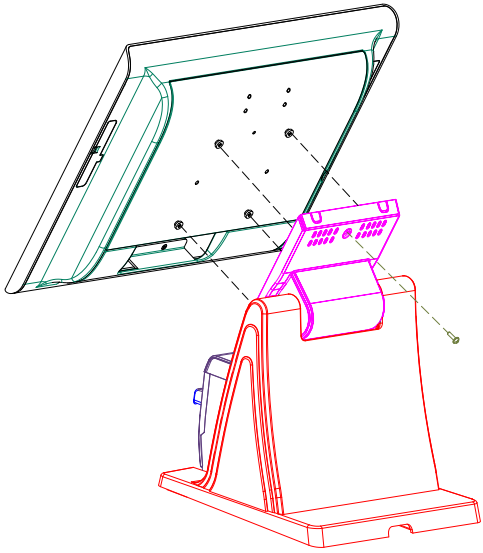
Step 2. Unassemble the HDD fixing screws

Easy Maintenance - Memory

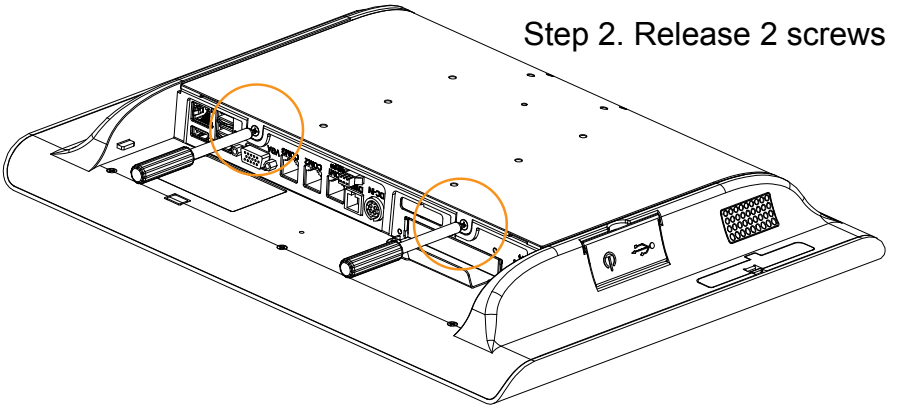
Step 1. Set the Panel PC and Stand apart from each other.



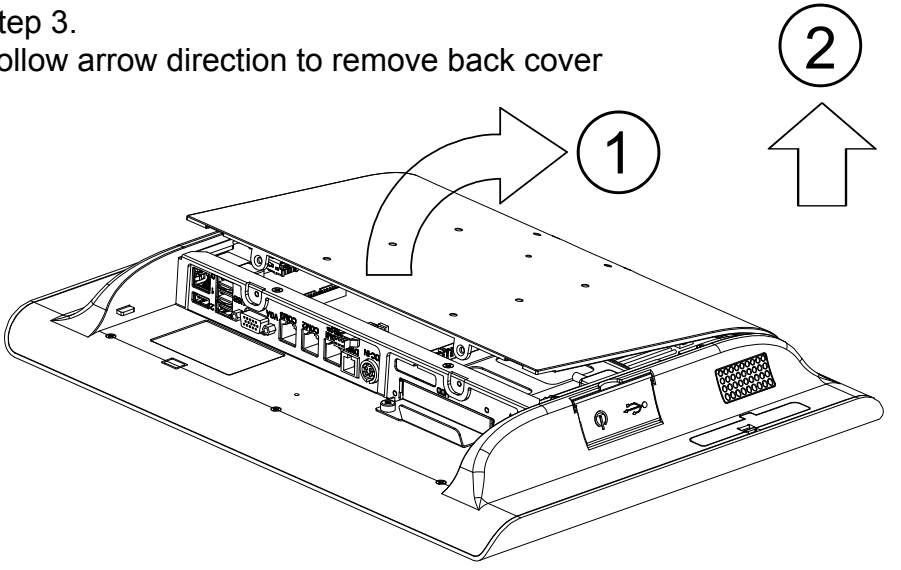


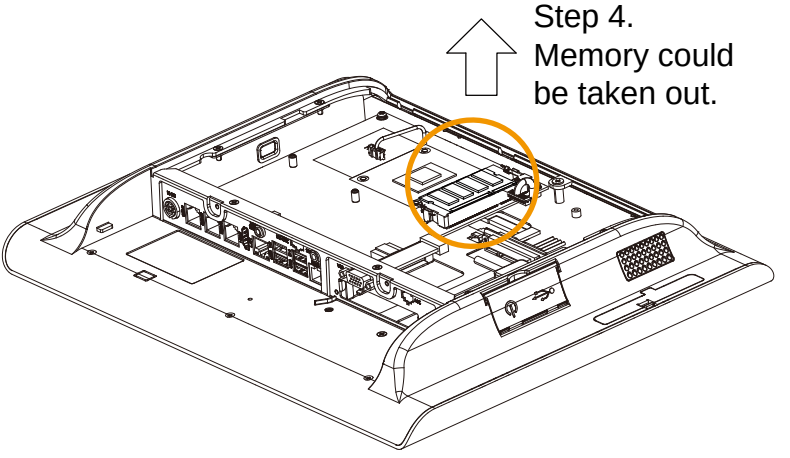


Step 2. Release 2 screws

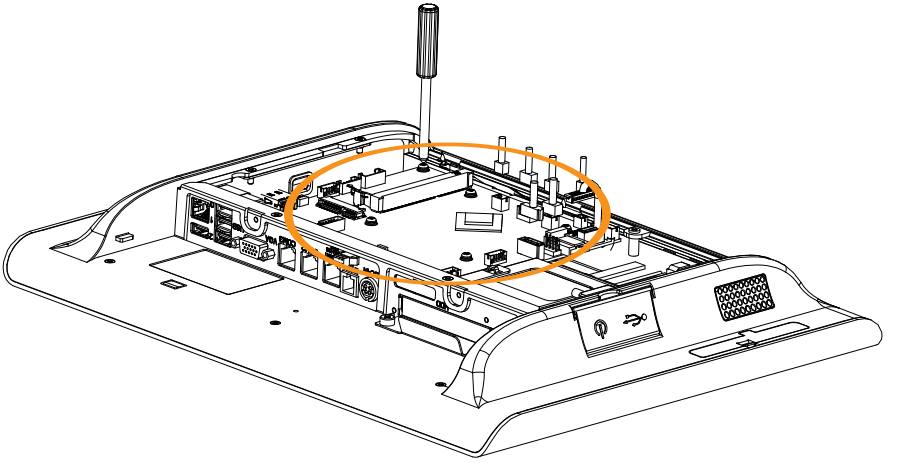


Step 3.
Follow arrow direction to remove back cover



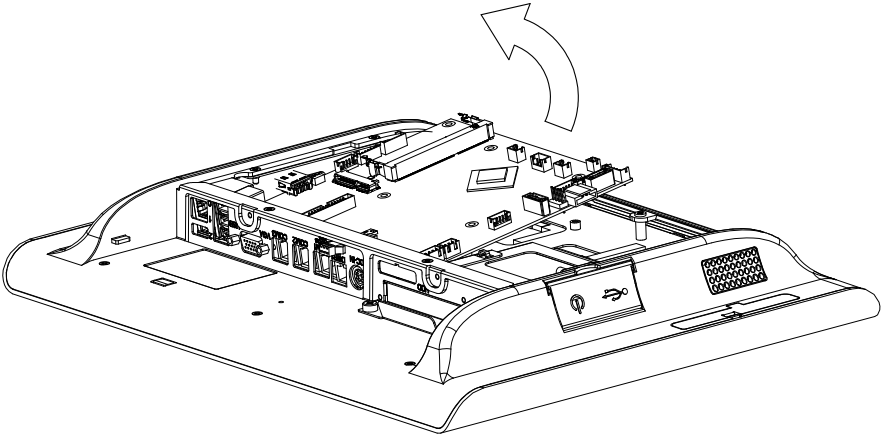

Step 4.
Memory could
be taken out.

Easy Maintenance - Mainboard

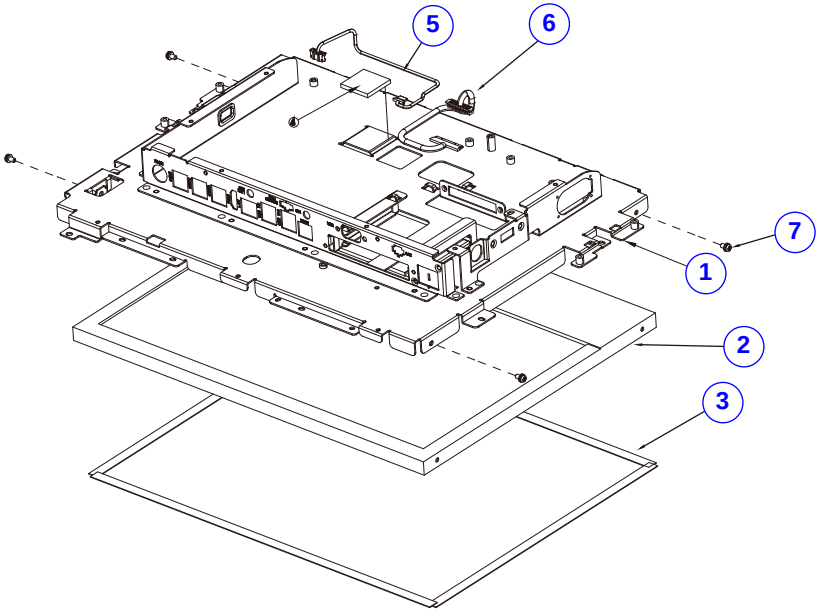


Step 1.
Pull out all cables which are connected on M/B and then release the fixing screws on M/B.

Step 2.
Follow the arrow direction to remove the Main Board.

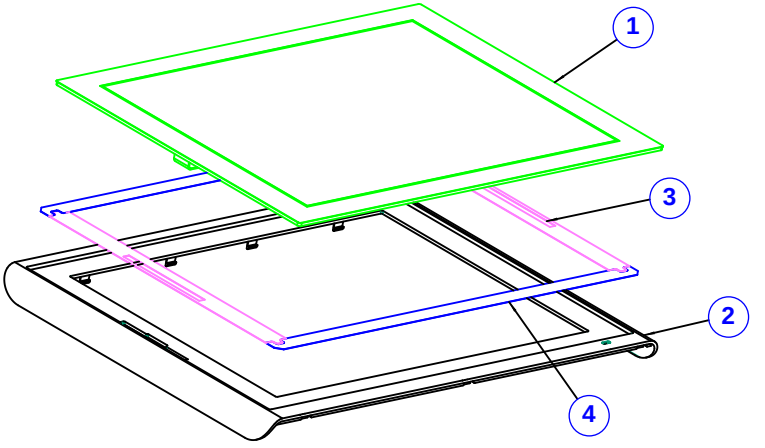


Exploded Diagrams for Panel PC
LCD Panel Display Exploded Diagram



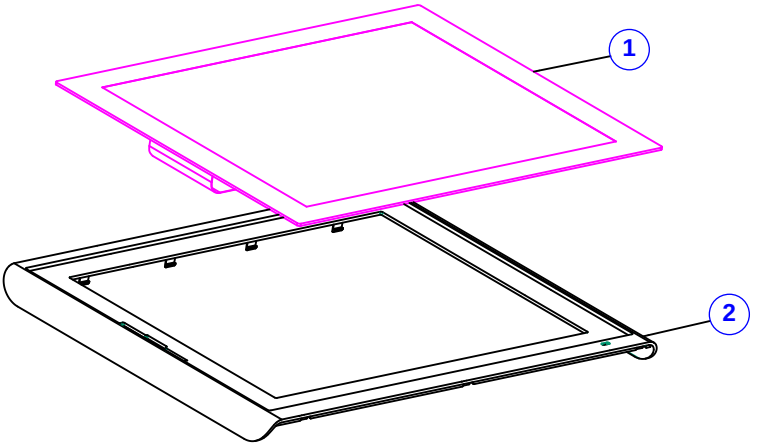
ITEM	Description	Part No.	Q'ty
1	PA-J670 LCD Holder Module	20-029-03001497	1
2	15" LCD Panel (LED backlight), 300nits, XGA (1024x768)	52-351-03150321	1
3	SPONGE (341.9x8x0.5 mm)	30-013-24100000	4
4	Thermal Interface Pads, K=6.2, 25x25x3mm (Blue)	81-006-82525002	1
5	Inverter Cable (G150XNE-L03)	27-015-49704071	1
6	PA-6225 LVDS Cable (30p to 20p) L=140mm	27-020-31403113	1
7	Round Head With Spring Washer Screw M3x0.5Px6mm	22-232-30060211	4

Resistive Flat Touch Panel Exploded Diagram



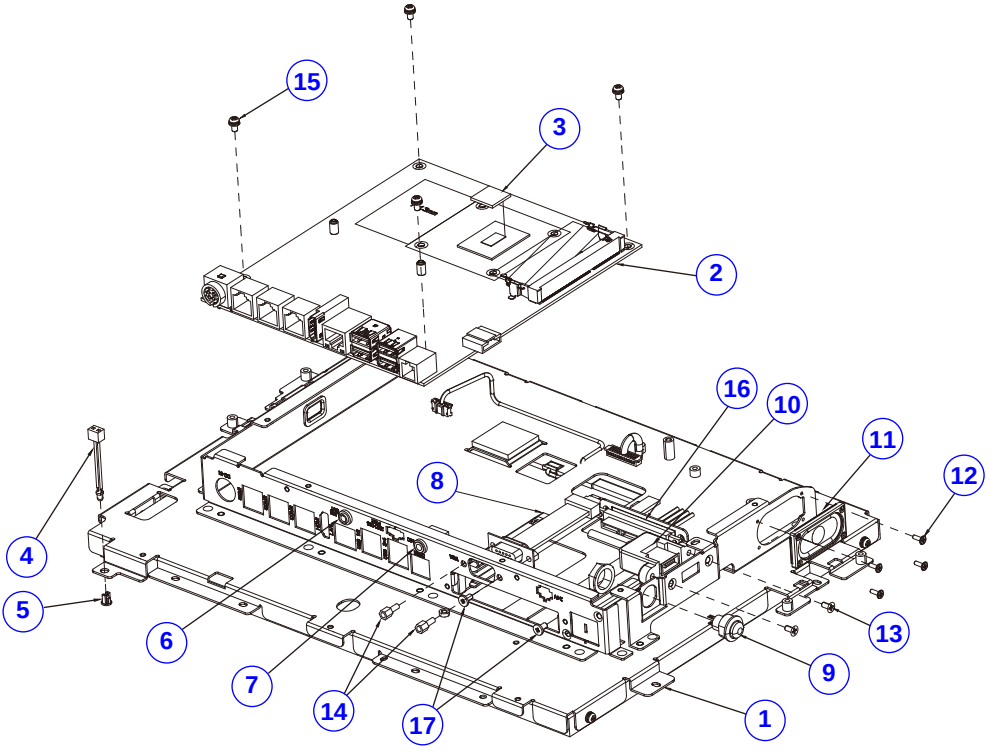
ITEM	Description	Part No.	Q'ty
1	15" Flat Resistive Touch Panel	52-380-00062401	1
2	PA-J670 Front Cover-A (FLAT TP) (Black)	30-002-28112353	1
3	PA-3251 Double Coated Tape B	94-026-04902220	2
4	PA-3251 Double Coated Tape A	94-026-04901220	2

Projected Capacitive Flat Touch Panel Exploded Diagram



BOM: Capacitive Flat_TP_module_Assy			
ITEM	**Description**	**Part No.**	**Q'ty**
1	15" Projected Capacitive Touch Panel	52-380-00543901	1
2	PA-J670 Front Cover (FLAT TP) (Black)	30-002-28310353	1

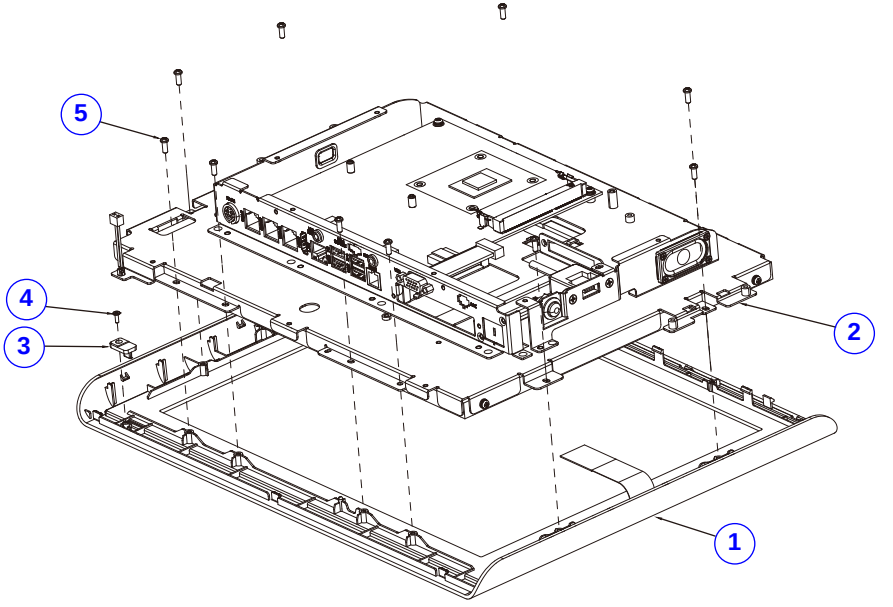
Mother Board Exploded Diagram



ITEM	Description	Part No.	Q'ty
1	Panel_Module_sub-assembly	N/A	1
2	PB-A900 M/B with J3455	PB-A900RA-D4N	1
3	Thermal Interface Pads, K=8, 15x15x1mm (Purple)	81-006-81515501	1
4	Powre LED Cable (Φ3 to 2F/P2.0) L=300mm (Green)	27-018-49706071	1
5	PS-3100 LED Housing (Black)	30-014-04100165	1
6	3.5mm Earphone Jack (Line Out)	TBD	1
7	3.5mm Phone Jack (Mic)	TBD	1
8	VGA Cable (DB15F to 16F/P2.0) L=300mm	27-017-49706031	1
9	PT-2070 Power Switch Cable L=400mm	27-019-33908071	1
10	PA-J670 1-Port USB Cable L=280mm	27-006-35306111	1
11	PA-6222/6225 Speaker Cable L=250mm	27-021-33505071	1
12	Fillister Head Screw #1 / M2x0.4Px4mm	22-272-20004011	4
13	Flat Head Screw #2 / UNC-No.4-40, L=8mm, FLAT=1.0mm	22-315-40008019	2

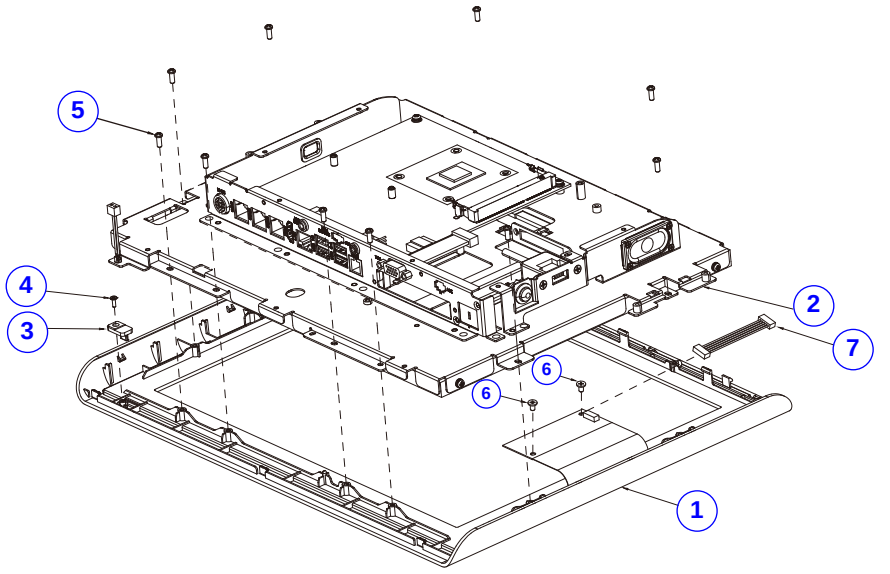
ITEM	Description	Part No.	Q'ty
14	HEX CU BOSS UNC No.4-40, L=4.8, H=7mm	22-692-40048051	2
15	Round Head with Spring Washer Screw M3x0.5Px6mm	22-232-30060211	4
16	SE-8134 SATA HDD & Power Cable L=100mm	27-008-40103081	1
17	Fillister Head Screw #2 / M3x0.5Px6mm	82-275-30006018	2

Resistive Touch Panel Module Exploded Diagram



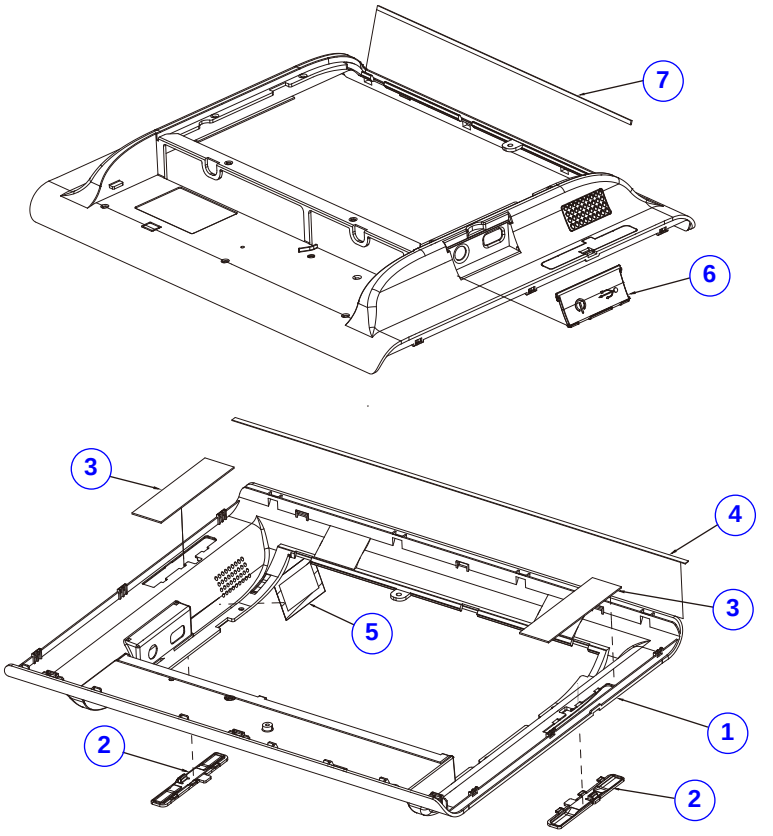
ITEM	Description	Part No.	Q'ty
1	Resistive_Flat_TP_Assy	N/A	1
2	Panel-MB-module_sub-assembly	N/A	1
3	PA-8525 LED Lens (Transparency)	30-021-02130343	1
4	Round Washer Head Screw #1 / T2.0x4mm	22-132-20004011	1
5	Pan Head Screw T3.0x6mm	22-132-30060011	10

P-CAP Touch Panel Module Exploded Diagram



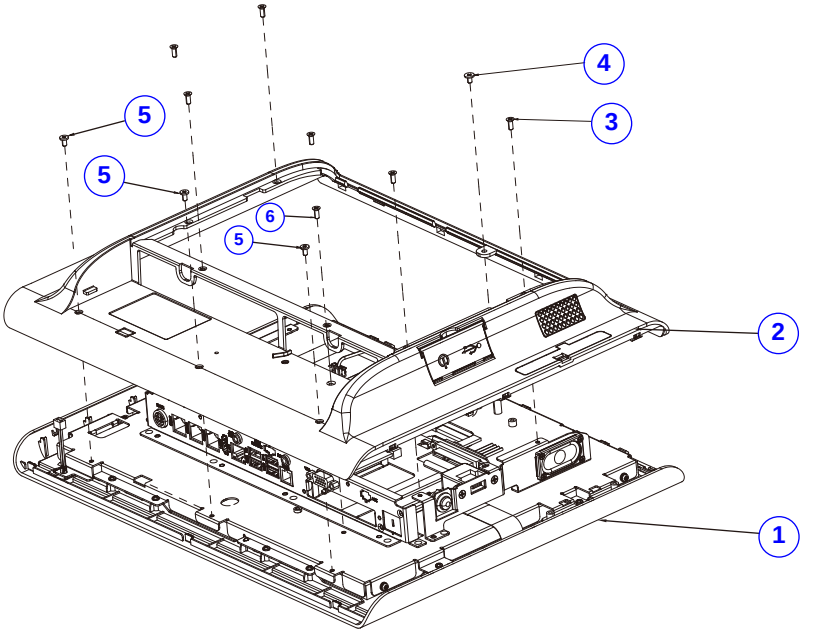
ITEM	Description	Part No.	Q'ty
1	Capacitive_Flat_TP_module_Assy	N/A	1
2	Panel-MB-module_sub-assembly	N/A	1
3	PA-8525 LED Lens (Transparency)	30-021-02130343	1
4	Round Washer Head Screw #1 / T2.0x4mm	22-132-20004011	1
5	Pan Head Screw T3.0x6mm	22-132-30060011	10
6	Fillister Head Screw #2 / M3x0.5Px4mm	82-272-30004018	2
7	PA-6980 Capacitive Touch Cable (5p to 5p) L=155mm	27-016-37704111	1

Front Cover Exploded Diagram



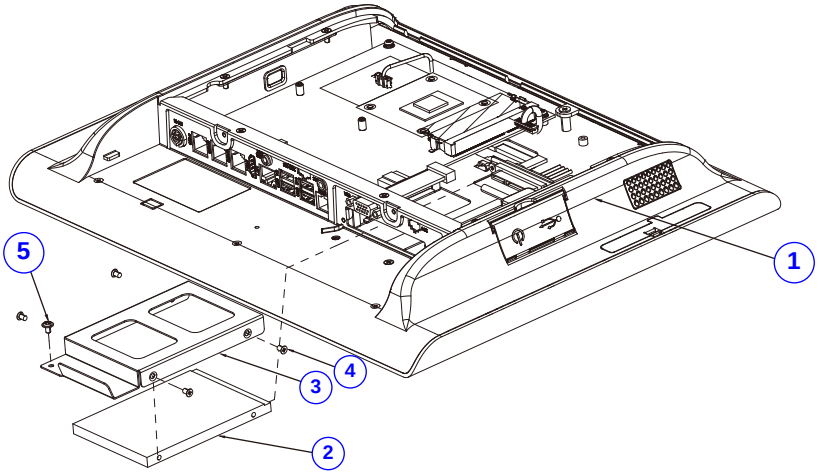
ITEM	Description	Part No.	Q'ty
1	PA-J670 Back Cover-2 (Black)	30-002-28111353	1
2	PA-J670 MSR Cover (Black)	30-002-28510353	2
3	PA-J670 EVA (90x25x1mm)	30-013-15100497	2
4	PA-J670 EVA (390x4x0.5mm)	30-013-15300497	1
5	PA-J670 Waterproof Membrane for Speaker Holes	30-083-25100497	1
6	PA-J670 USB Cover (Black)	30-002-28810353	1
7	PA-J670 EVA (275x3x1mm)	30-013-15200497	1

Back Cover Exploded Diagram



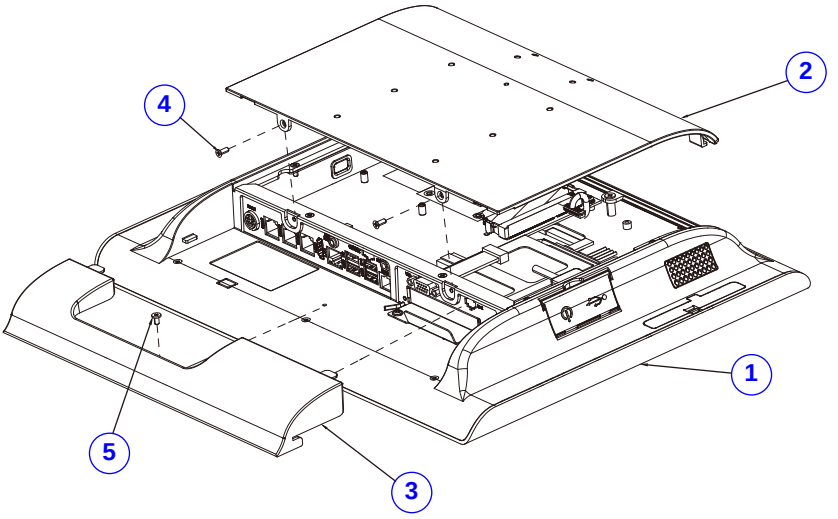
ITEM	Description	Part No.	Q'ty
1	Front_module_sub-assembly	N/A	1
2	Back-cover-module_sub-assembly	N/A	1
3	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	6
4	Fillister Head Screw #2 / M3x0.5Px6mm	22-275-30006011	1
5	Fillister Head Screw #2 / M3x0.5Px6mm	82-275-30006018	3
6	Flat Head Screw M3x0.5Px6mm (Black)	22-215-30060011	1

HDD Module Exploded Diagram



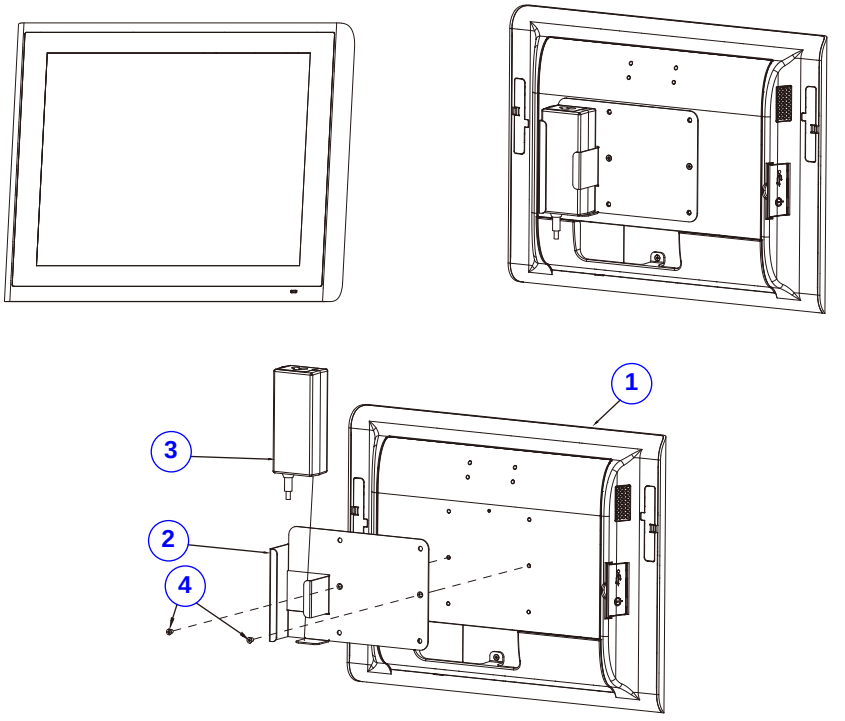
ITEM	Description	Part No.	Q'ty
1	PA-J670 PPC Sub-assembly	N/A	1
2	HDD or SSD	N/A	1
3	PA-J670 HDD Tray	20-054-03001353	1
4	Flat Head Screw #2 / M3x0.5Px4mm	22-215-30004311	4
5	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	1

Cable Cover Exploded Diagram



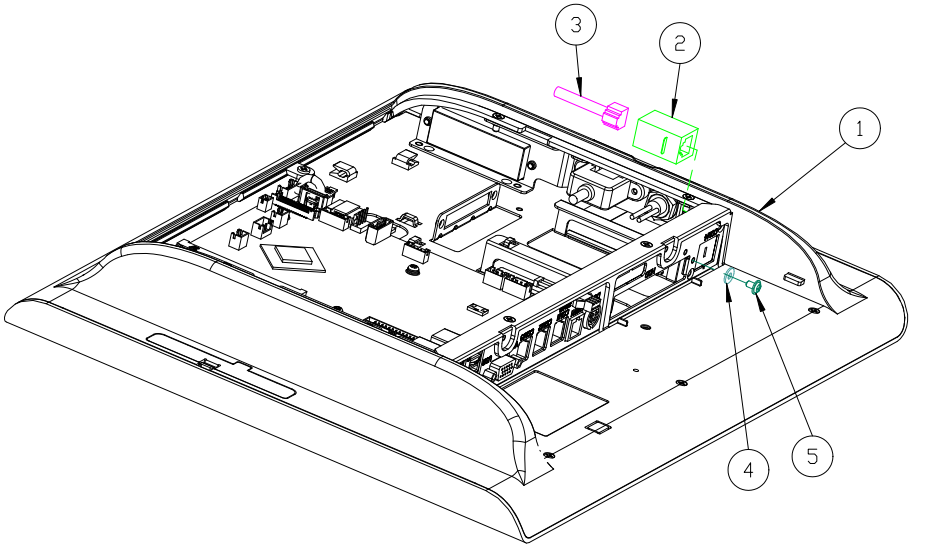
ITEM	Description	Part No.	Q'ty
1	PA-J670 PPC Sub-assembly	N/A	1
2	PA-J670 AL Cover-1 (w/Paint) (Black)	20-004-01062353	1
3	PA-J670 Cable Cover (Black)	30-002-28210353	1
4	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	2
5	Fillister Head Screw #2 / M3x0.5Px6mm	82-275-30006018	1

Power Adaptor Holder Exploded Diagram



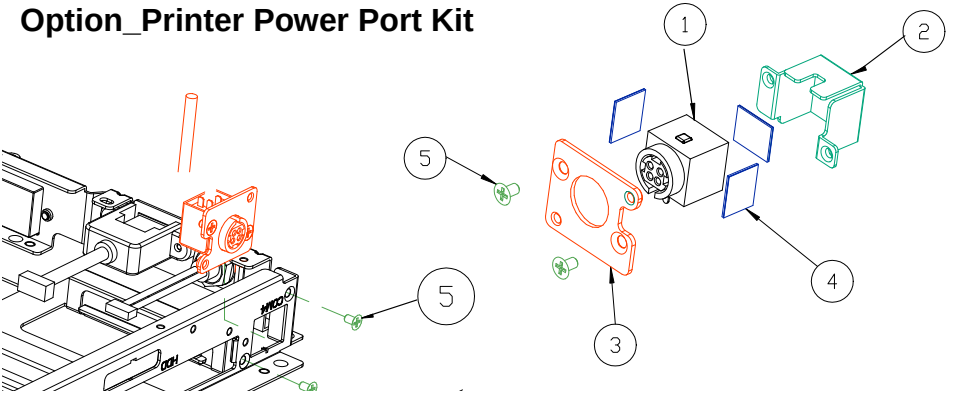
ITEM	Description	Part No.	Q'ty
1	PA-J670 PPC assembly	N/A	1
2	PA-J670 Adaptor Holder 60W (w/Paint) (Black)	20-029-02061497	1
3	60W AC to DC 24V/2.5A Power Adaptor	52-002-10683002	1
4	Flat Head Screw #2 / M4x0.7Px6mm (Black)	22-215-40006011	2

Option_COM4 Kit



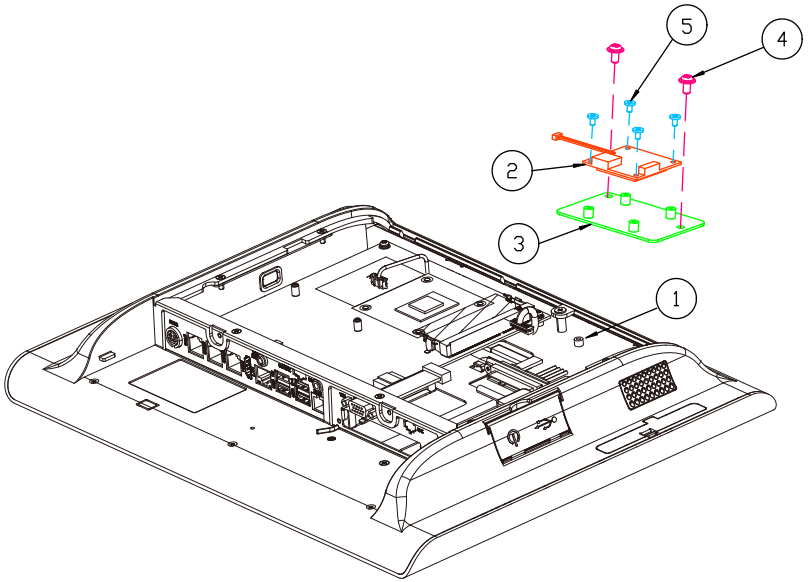
ITEM	Description	Part No.	Q'ty
1	Back_cover_module	N/A	1
2	Modular_Coupler_Jack	10-085-10012035	1
3	COM_To_RJ45_Cable	27-051-35305031	1
4	Washer	23-312-30080081	1
5	Round Washer Head Screw	22-242-30005311	1

Option_Printer Power Port Kit



ITEM	Description	Part No.	Q'ty
1	PRINT_PWR_Cable	27-012-35304111	1
2	DC_Jack_Holder	80-029-03001353	1
3	DC_Jack_Plate	80-005-03001353	1
4	EVA_Sponge	90-013-15100314	3
5	Flat Head Screw	22-212-30005311	4

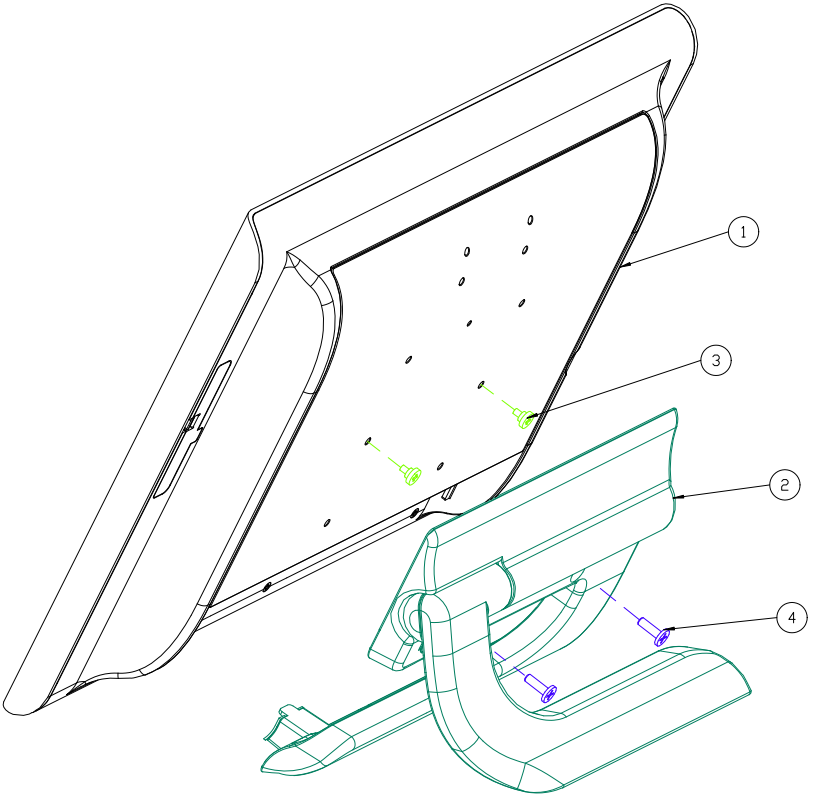
Option_RFID Board Kit



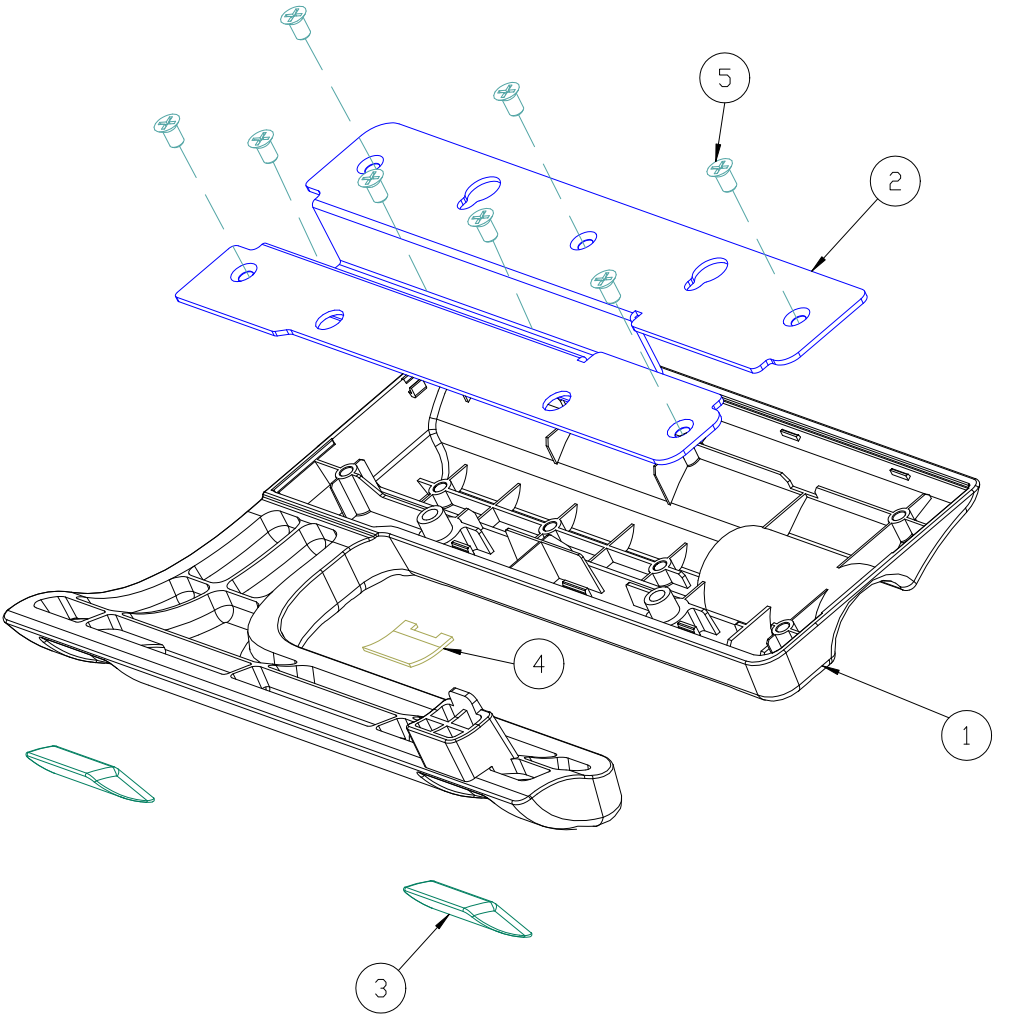
ITEM	Description	Part No.	Q'ty
1	MB_Module_ASSY	N/A	1
2	RFID_Antenna_PCB	27-068-31002111	1
3	RFID_Bracket		1
4	Round Washer Head Screw	22-242-30005311	2
5	Fillister Head Screw	22-272-20003011	4

Exploded Diagrams for Stand

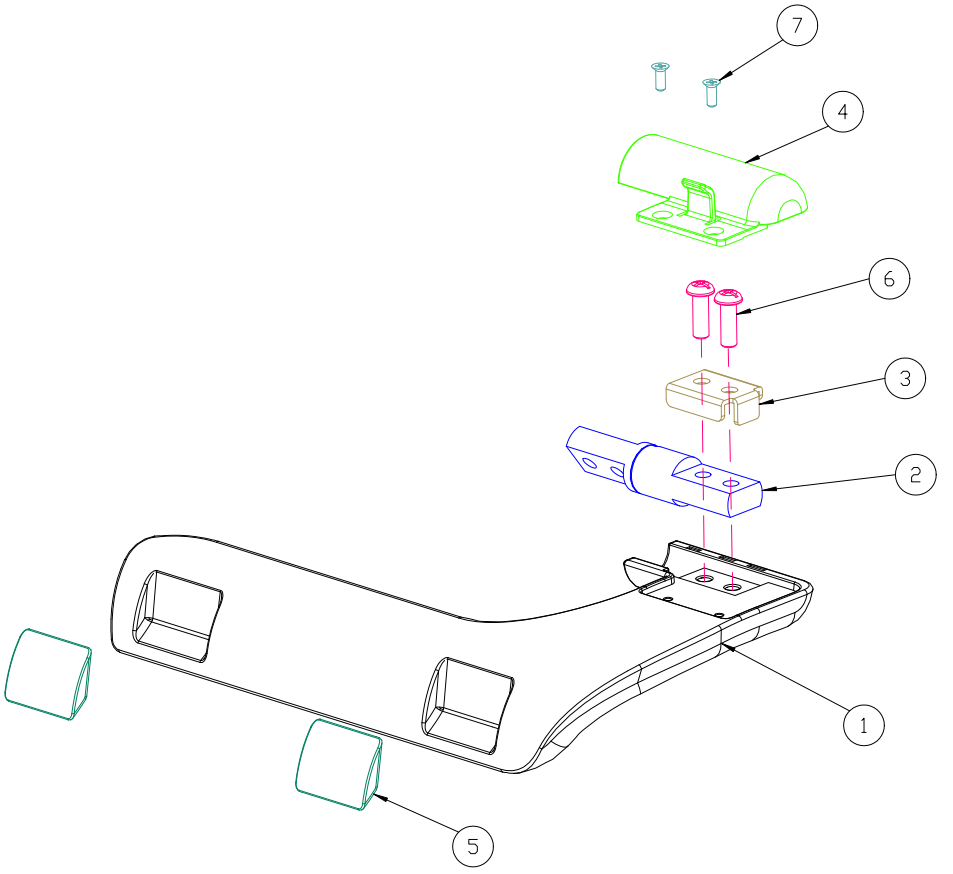
Easy Stand



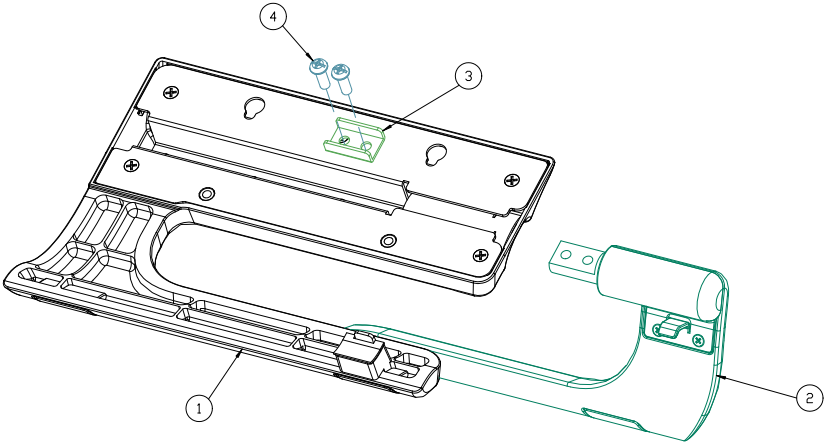
ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC	N/A	1
2	PA-J670_Stand_module	N/A	1
3	Fillister Head Screw	22-272-40004911	2
4	Round Head Screw	22-245-40012031	2



ITEM	Description	Part No.	Q'ty
1	Stand Cover (Black)	30-002-28610353	1
2	Hinge Base	20-032-21001353	1
3	Silicone Rubber	90-013-06100353	2
4	EVA_Stand	90-013-15300353	1
5	Flat Head Screw	22-112-40007015	8

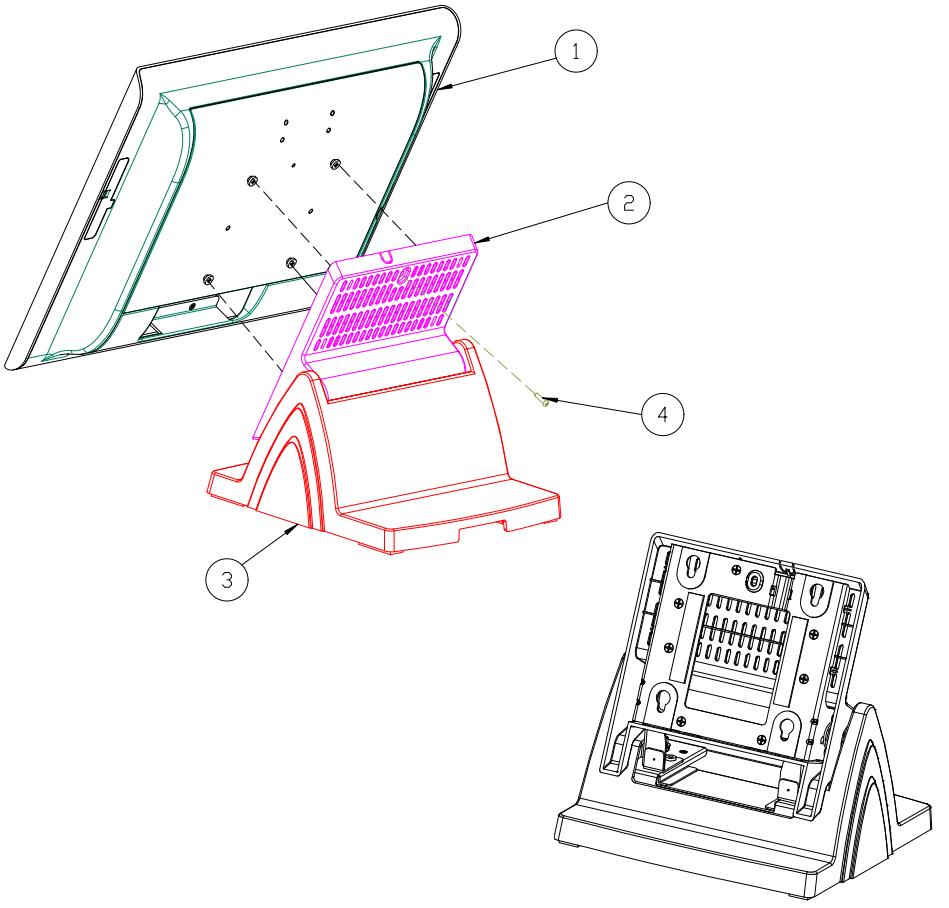


ITEM	Description	Part No.	Q'ty
1	Stand Holder (Black)	20-029-01061353	1
2	PA-6225 Stand Hinge L	20-012-29001314	1
3	Hinge Fix Bracket 2	20-006-21002353	1
4	Stand Holder Cover (Black)	30-002-28710353	1
5	Silicone Rubber	90-013-06100353	2
6	Round Head Screw	22-232-50015011	2
7	Flat Head Screw	22-215-30006311	2



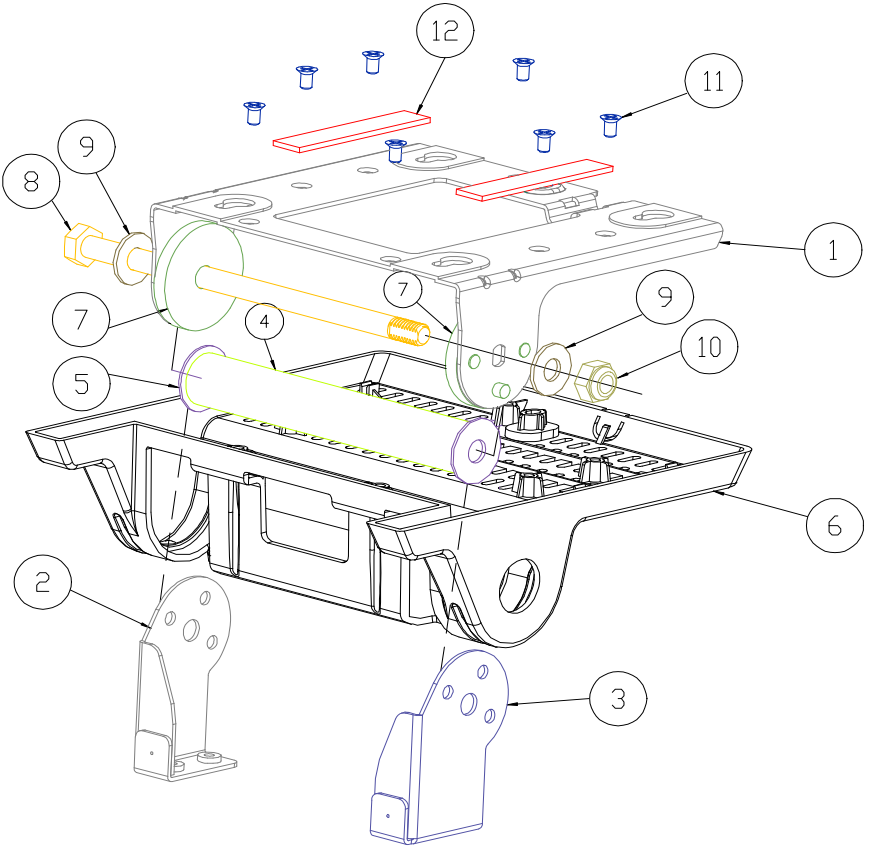
ITEM	Description	Part No.	Q'ty
1	Stand_cover_module	N/A	1
2	Stand_holder_module	N/A	1
3	Hinge Fix Bracket_1	20-006-21001353	1
4	Round Head Screw	22-232-50015011	2

Normal Stand



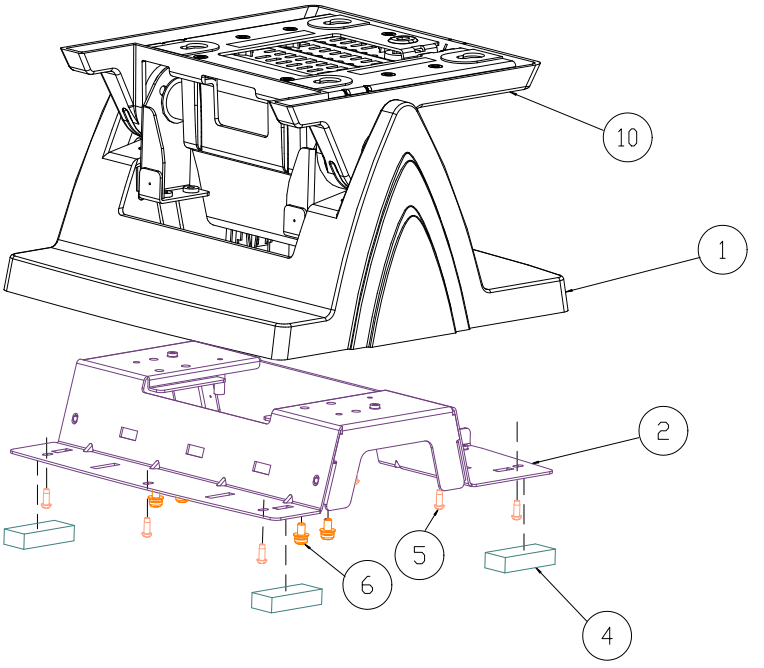
ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC_Module	N/A	1
2	PA-6151_Rotate_Module	N/A	1
3	PA-6151_Stand_Module	N/A	1
4	RW_Screw_M3_L15mm	22-235-30015011	1

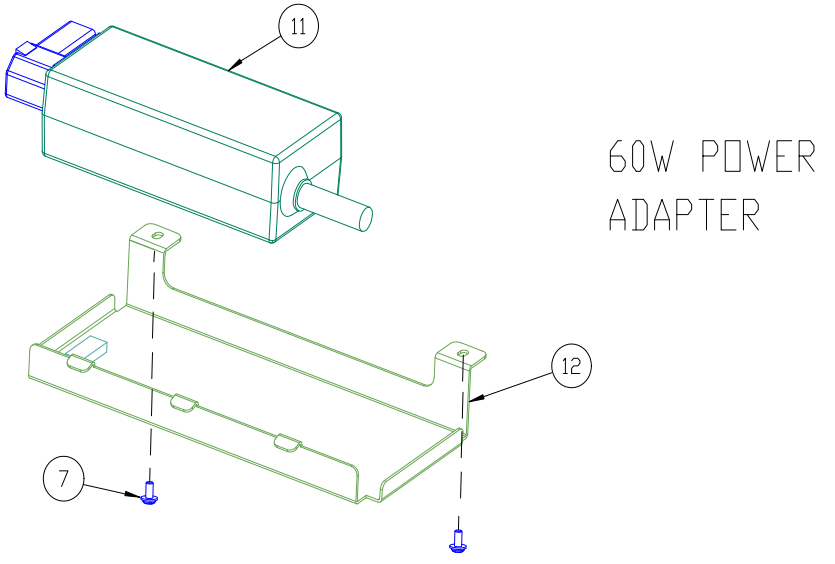
Rotation Part (1)



ITEM	Description	Part No.	Q'ty
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

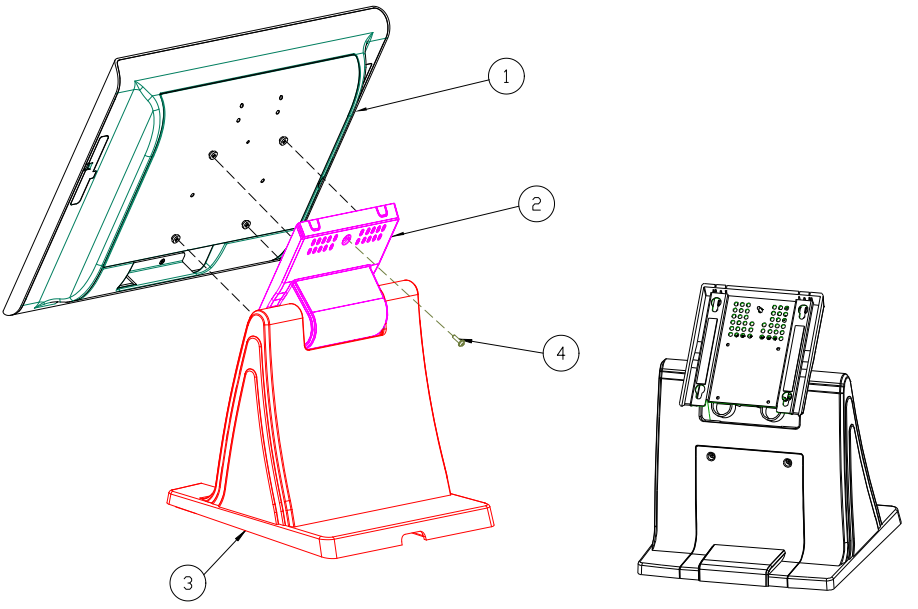
Bottom Case (1)





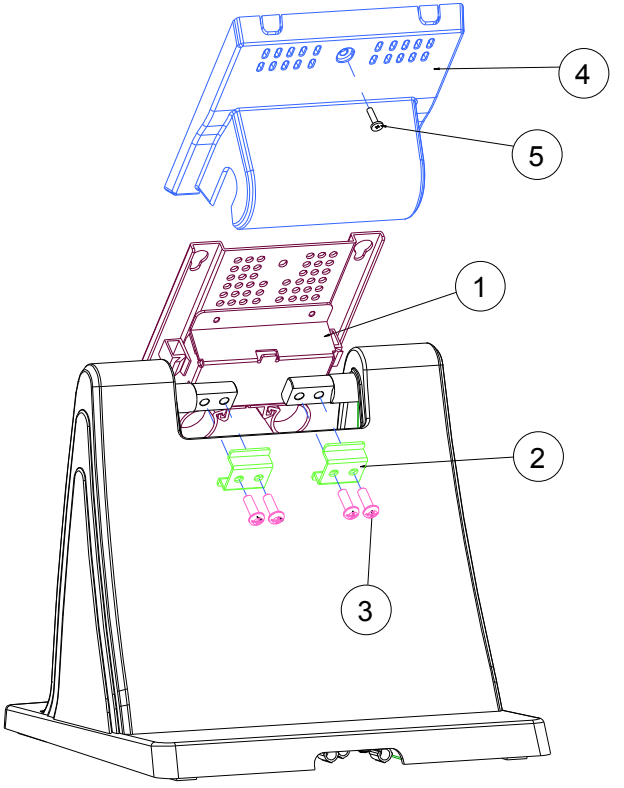
ITEM	Description	Part No.	Q'ty
1	POS-6920-Stand-Cover	30-002-28710226	1
2	POS-6920-Stand-Base	80-032-03001226	1
4	Rubber Foot	30-004-01600000	4
5	Tapping Screw T3.0x8mm	22-122-30080011	9
6	R_S_Screw, M4.0x0.7Px8mm	22-232-40008211	4
7	R_S_Screw, M3.0x0.5Px6mm	22-232-30006311	2
10	POS-6920_Rotate_Module	N/A	1
11	60W Power Adaptor	52-002-10068302	1
12	PA-6970 Power Holder	80-029-03001253	1

Big Stand

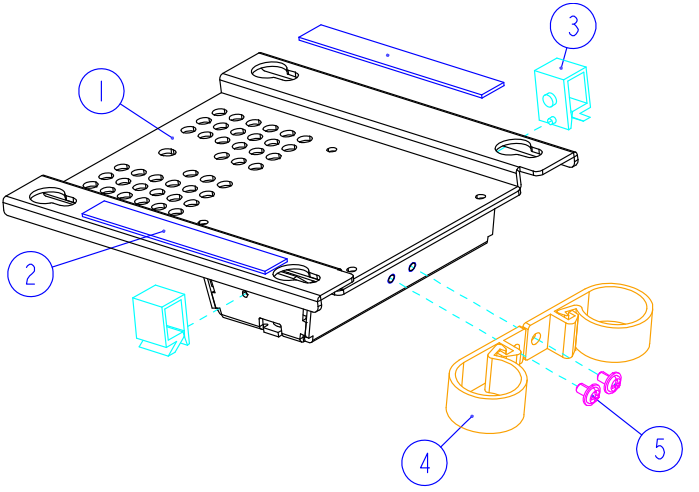


ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC_Module	N/A	1
2	PA-6225_Rotate_Module	N/A	1
3	PA-6225_Stand_Module	N/A	1
4	RW_Screw_M3_L15mm	22-235-30015011	1

Rotation Part (2)

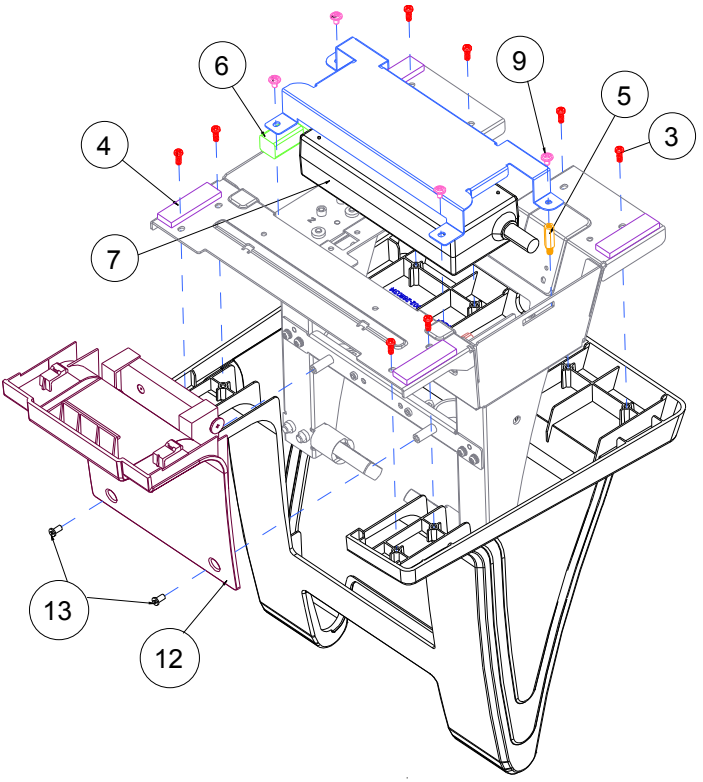


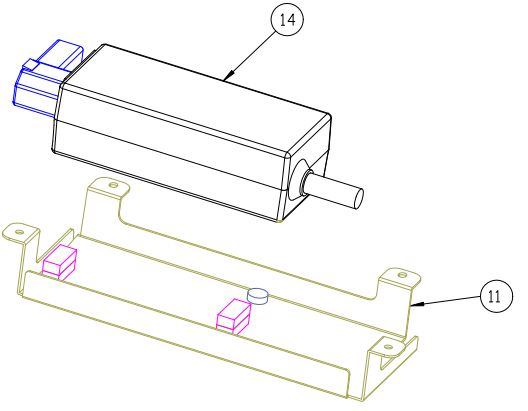
ITEM	Description	Part No.	Q'ty
1	Rotate Base assembly	N/A	1
2	Hinge-Fixing	80-012-03001314	2
3	Screw / M5x0.8Px15mm	22-232-50015011	4
4	Stand Rotate Cover	30-002-28410314	1
5	Screw / M3x0.5Px12mm	22-275-30010011	1



ITEM	Description	Part No.	Q'ty
1	Rotate-Base	20-032-03001314	1
2	Rotate_Base-Sponge	30-013-24100314	2
3	Cable Clamp	90-042-04100314	2
4	Cable Clamp	30-042-04100314	2
5	M3 Screw	22-242-30005311	2

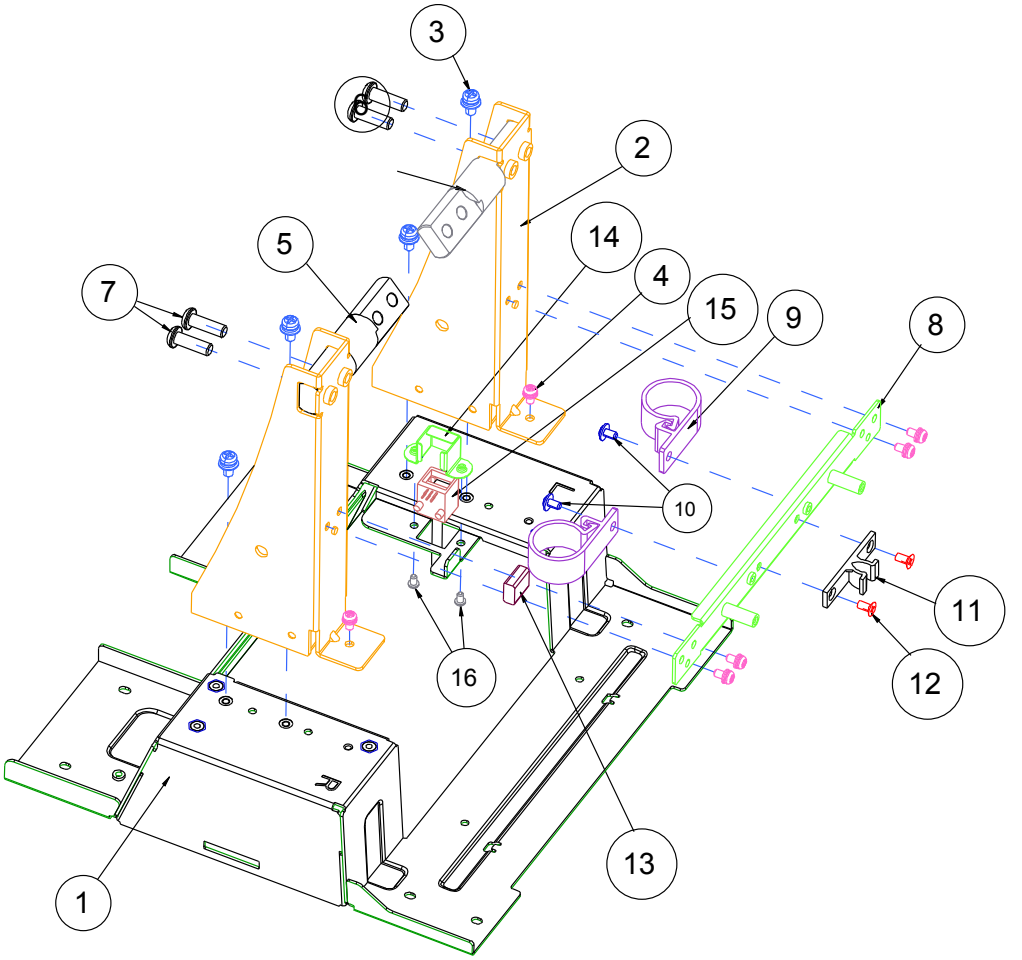
Bottom Case (2)



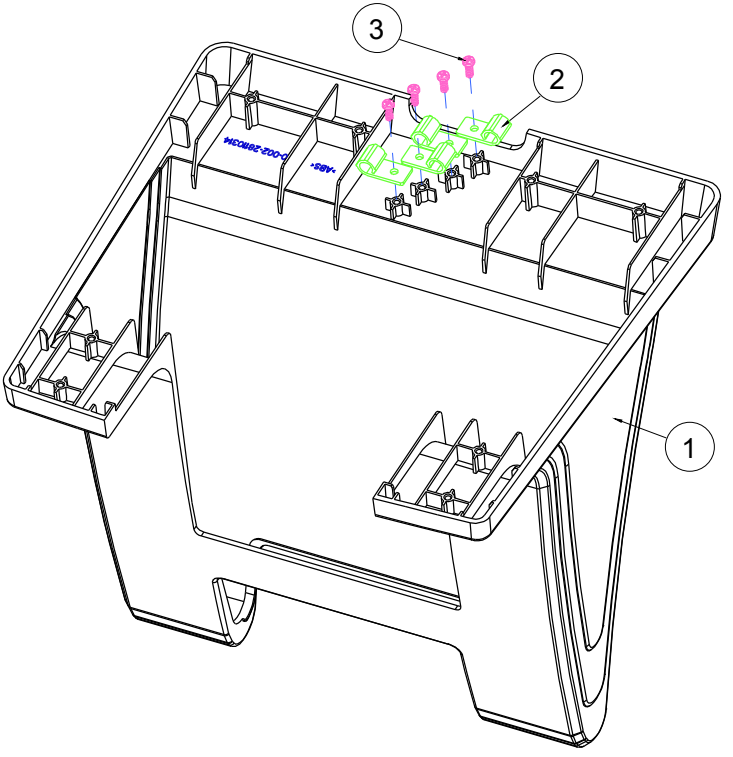


60W_POWER_ADAPTER

ITEM	Description	Part No.	Q'ty
3	SCREW / T3.0x8mm	22-122-30080011	8
4	Rubber Foot (40x12x4mm)	30-004-01100314	4
5	HEX CU BOSS / M3x0.5Px6L, H=15	22-290-30015051	1
7	72W Adaptor	N/A	1
9	Screw / M3x0.5Px5mm	22-242-30005311	4
11	120W_Adaptor_Bracket	80-029-03003314	1
12	No Printer cover assembly	N/A	1
13	SCREW / M3x0.5Px6mm	82-275-30006018	2
14	60W_Power_Adaptor	52-002-10068302	1

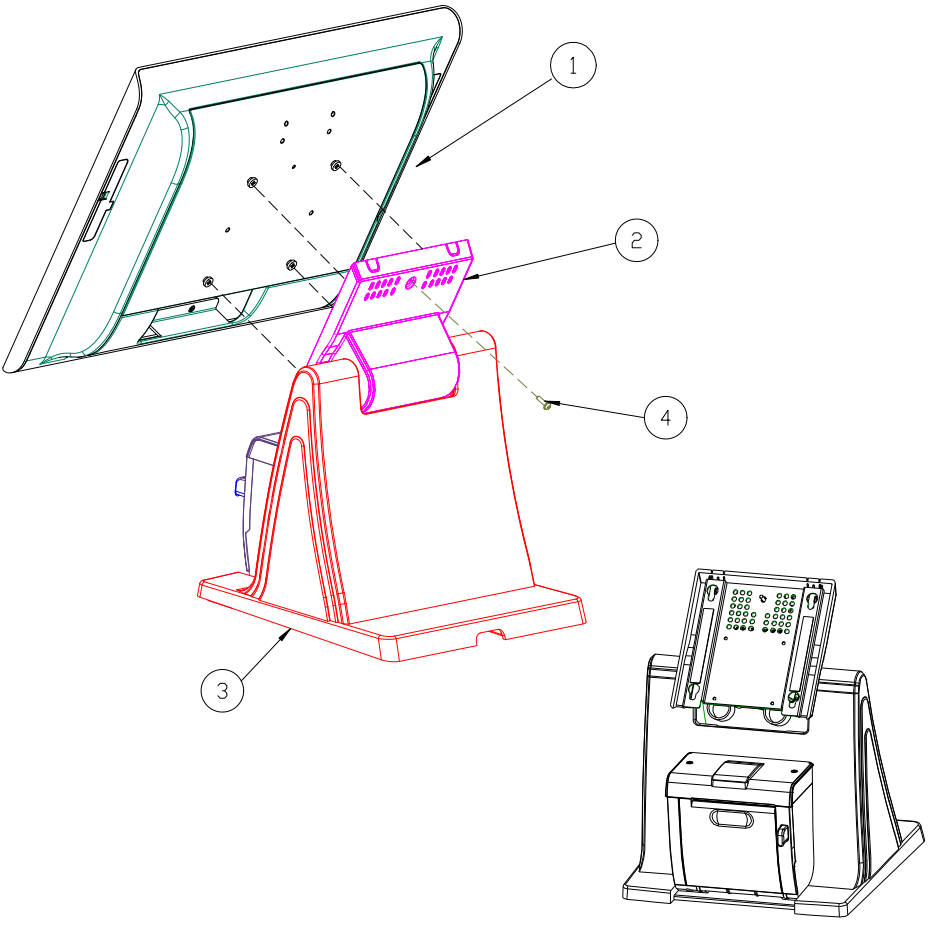

3
2
14
4
5
7
15
9
8
10
11
12
16
13
1

ITEM	Description	Part No.	Q'ty
1	PA-6225 Stand Base Bracket	80-006-03005314	1
2	PA-6225 Stand Support Bracket	80-006-03007314	2
3	Round Head with Spring Washer Screw M4x0.7Px8mm	22-232-40008211	4
4	Round Head with Spring Washer Screw M3x0.5Px6mm	22-232-30060211	6
5	PA-6225 Stand Hinge R	20-012-29002314	1
6	PA-6225 Stand Hinge L	20-012-29001314	1
7	Round Head Screw #2 / M5x0.8Px15mm	22-232-50015011	4
8	PA-6225 Stand Link Bracket	80-006-03006314	1
9	Cable Clamp	90-023-04100314	2
10	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	2
11	Latch	90-023-09100000	1
12	Flat Head Screw M3x0.5Px6mm	22-212-30006011	2
13	EMI Shielding Gasket (12x10x5mm)	90-050-31100000	1
14	PS-3100 RJ11 Holder	80-029-03002165	1
15	PS-3100 Cash Drawer Cable L=250mm	27-026-16505111	1
16	Round Head Screw M2.5x0.45Px4mm	22-232-25004011	2



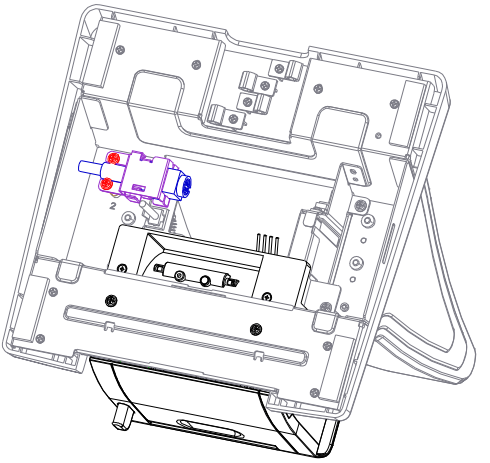
ITEM	Description	Part No.	Q'ty
1	Stand Cover	30-002-28110314	1
2	Cable Clamp	90-023-04200314	4
3	SCREW/T3.0x8mm	22-122-30080011	4

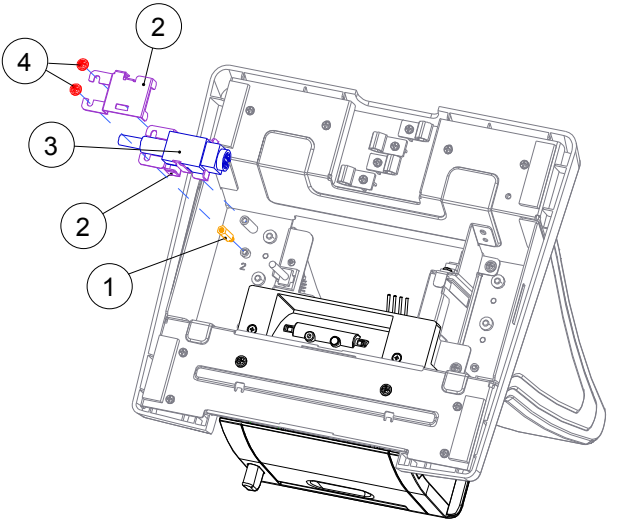
Printer Stand



ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC_Module	N/A	1
2	PA-6225_Rotate_Module	N/A	1
3	PA-6225_Stand_Module	N/A	1
4	RW_Screw_M3_L15mm	22-235-30015011	1

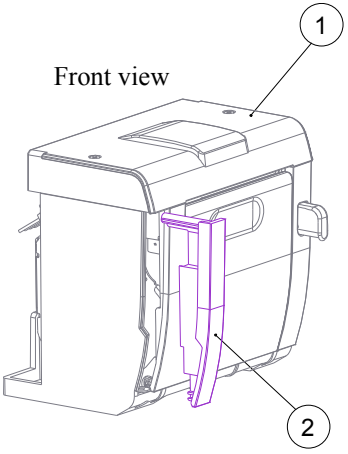
Extension Power Cable

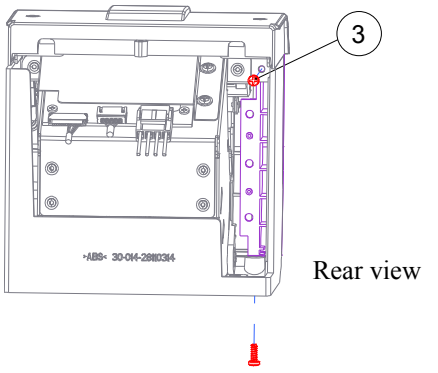


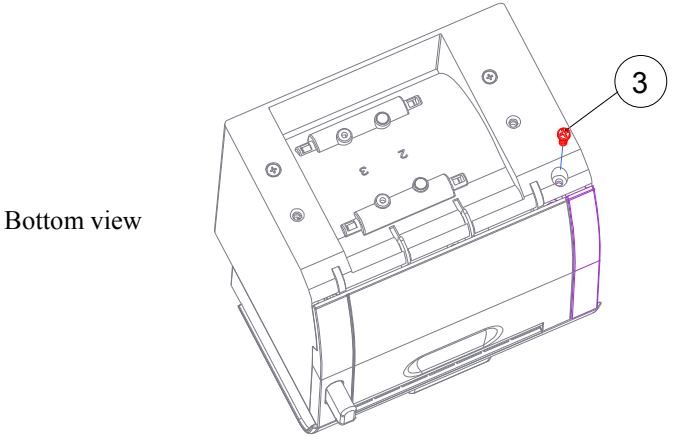


ITEM	Description	Part No.	Q'ty
1	HEX CU BOSS/M3x0.5Px6L, H=15mm	22-290-30015051	1
2	DC IN CLIP	80-014-03001314	2
3	DC IN EXTENDED CABLE	27-012-31408111	1
4	SCRE /M3x0.5Px5mm	22-242-30005311	2

Exploded Diagrams for Printer Module

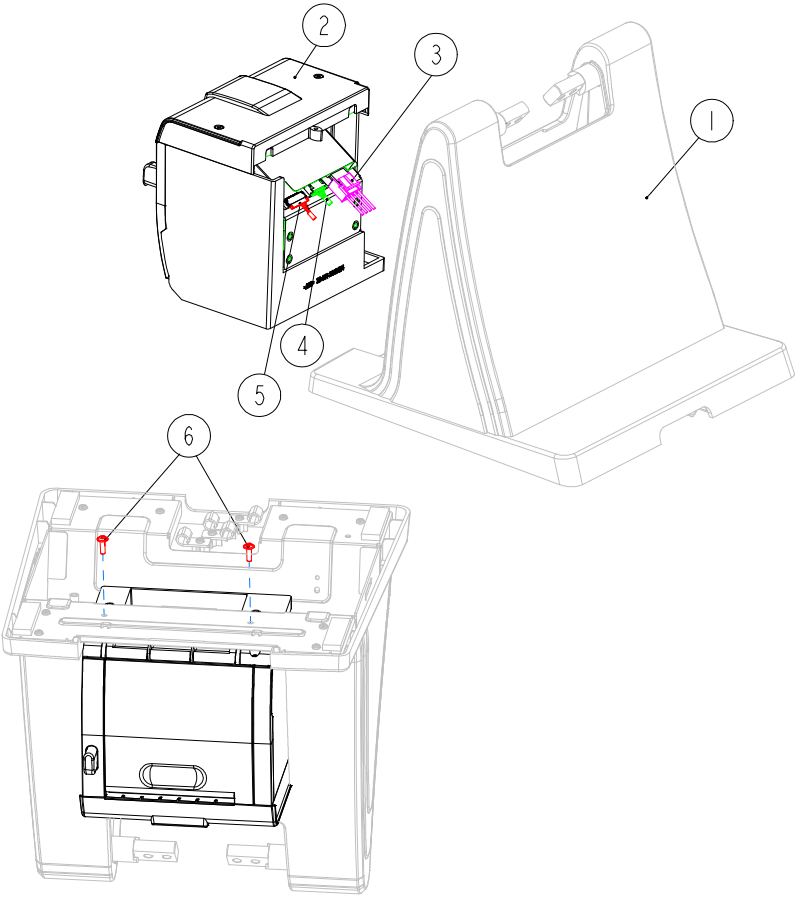




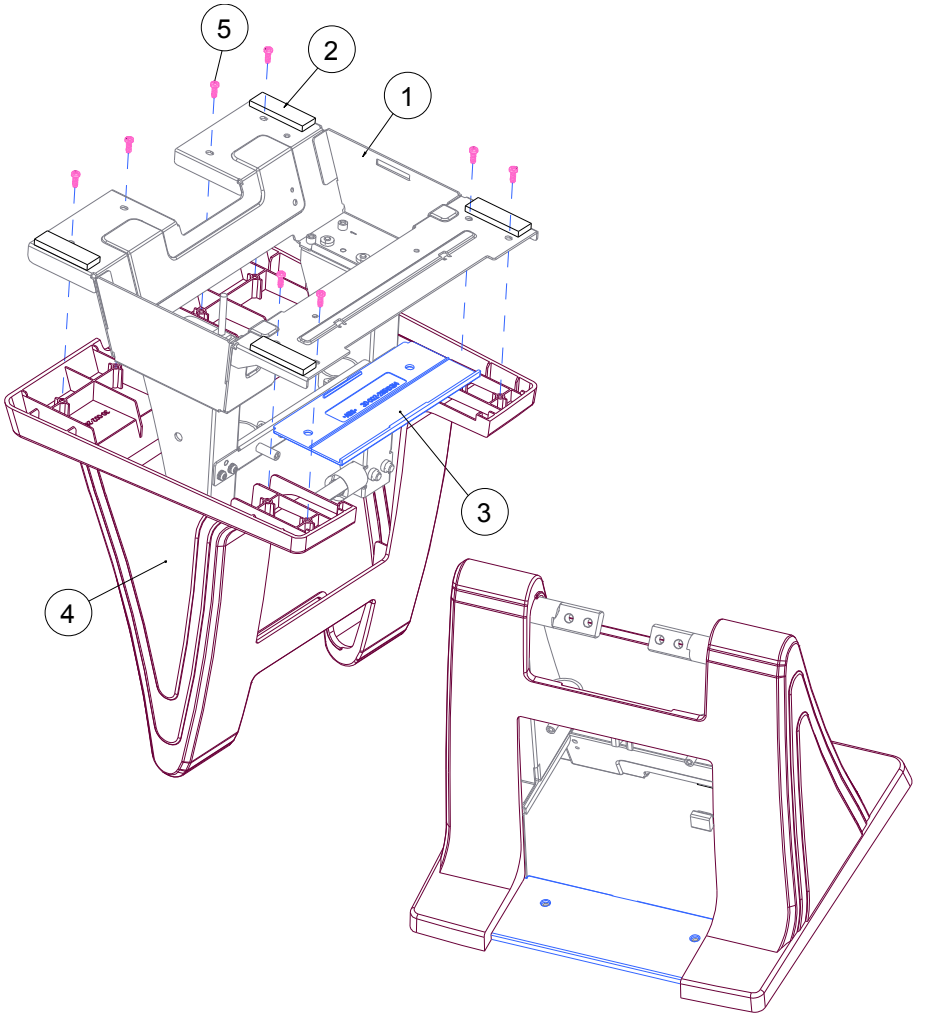


ITEM	Description	Part No.	Q'ty
1	Printer Module	N/A	1
2	Stand HDD Cover	30-002-02110314	1
3	SCREW/T3.0x8mm	22-122-30080011	2

Thermal Printer

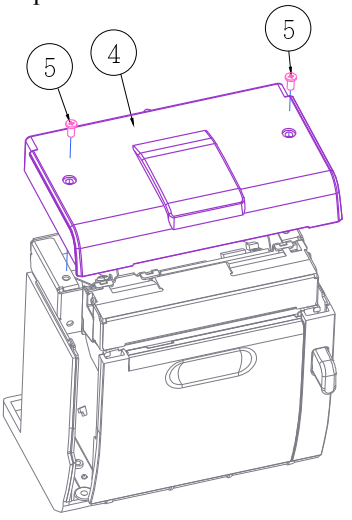


ITEM	Description	Part No.	Q'ty	Note
1	HDD-Socket_Assembly	N/A	1	
2	Printer Module_with_HDD Cover	N/A	1	
3	Printer Power Cable	27-012-31409071	1	
4	Print For USB Cable	27-006-31409111	1	
	Print For USB Cable	27-006-31409112	0	
	Print For USB Cable	27-051-31408111	0	
	Print For USB Cable	27-051-31408113	0	
	Print For USB Cable	27-051-31408112	0	
5	Cash Drawer Cable	27-026-16505111	1	option
6	Screw / M3 x 0.5P x 10mm	22-232-30010311	2	

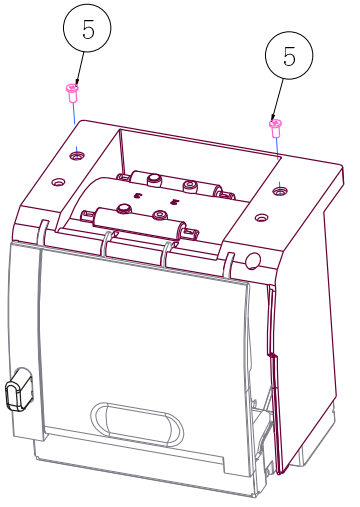


ITEM	Description	Part No.	Q'ty	Note
1	S AND BRACKET ASSEMBLY	N/A	1	
2	RUBBER FOOT	30-004-01100314		
3	STAND DRESS COVER	30-002-28510	1	For with printer
4	S AND COVER ASSEMBLY	N/A	1	
5	SCREW/T3.0x8mm	22-122-30080011	8	

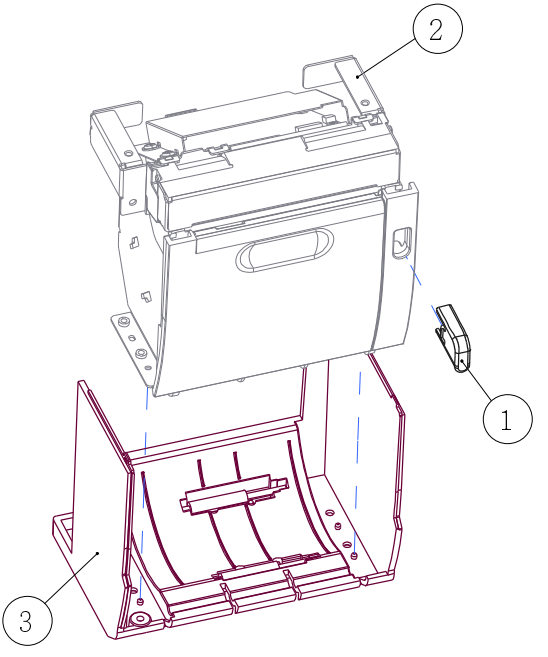
Top view



Bottom view

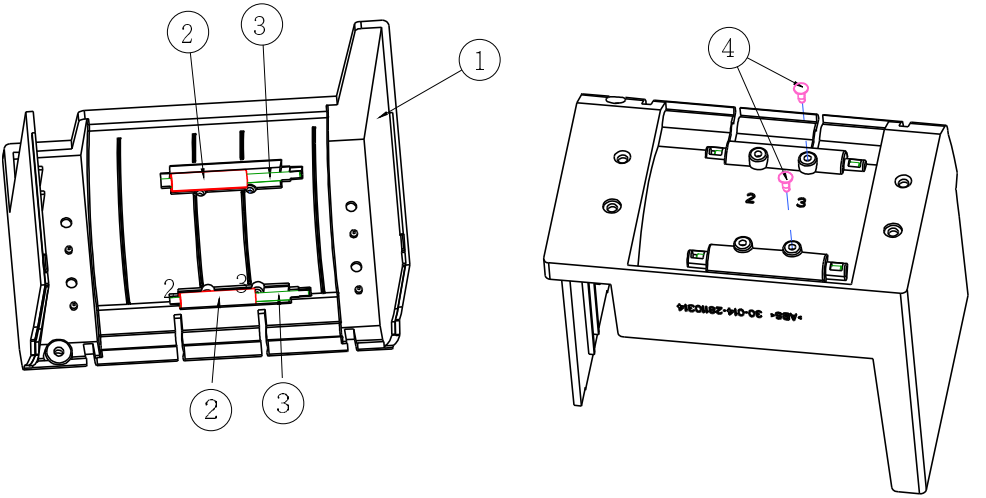


Separation view



ITEM	Description	Part No.	Q'ty
1	Printer Door Switch	30-007-28110314	1
2	Printer Holder Assembly	N/A	1
3	Housing Assembly	N/A	1
4	Screw / M3x0.5P x 6mm	82-275-30006018	4
5	Stand Printer Cover	30-002-28310314	1

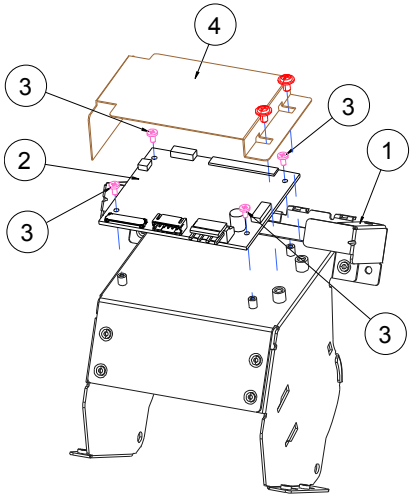
3-Inch Printer



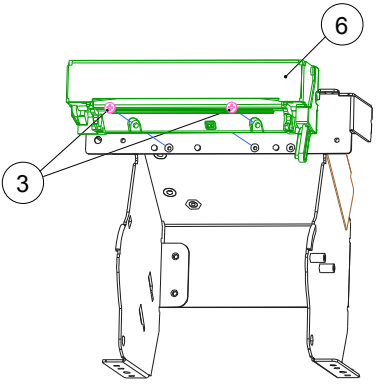
ITEM	Description	Part No.	Q'ty
1	Stand Printer Housing	30-014-28110314	1
2	PS-3100 SPACER SUPPORT (Φ6x25mm)	30-041-04100165	2
3	Roller Pin	20-045-19012199	2
4	Canoe Clip (Φ2.9mm)	90-042-04100000	2

3-Inch Printer Assembly

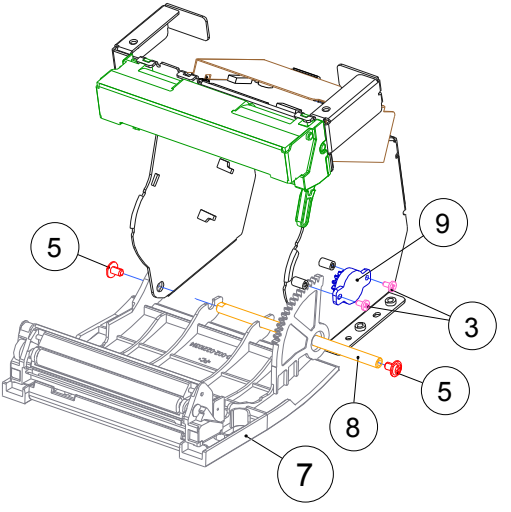
Step-1:



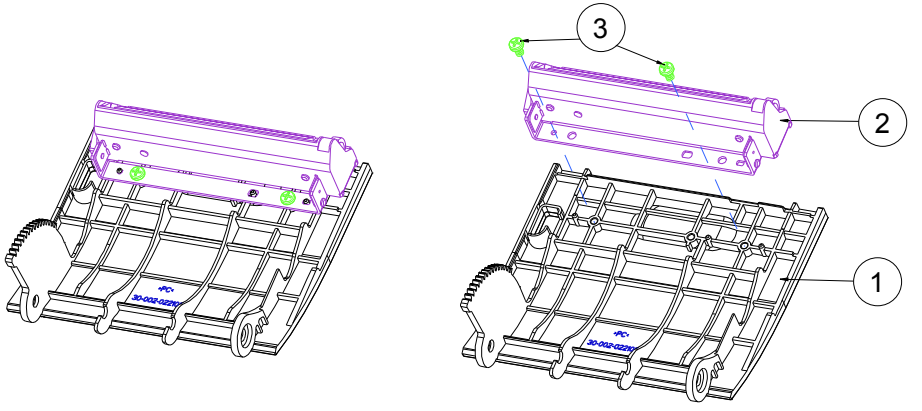
Step-2:



Step-3:

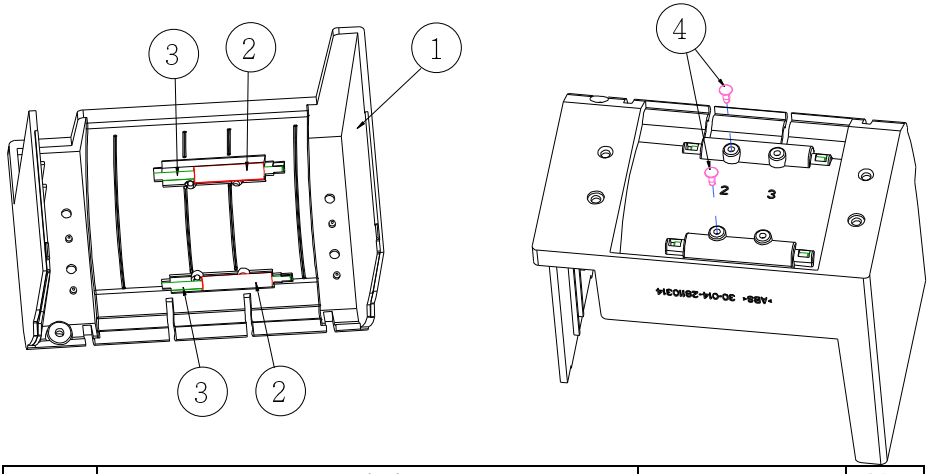


ITEM	Description	Part No.	Q'ty
1	Printer Holder	80-029-03004314	1
2	Printer Board	17-122-10301028	1
	Printer Board	52-370-06310008	0
	Printer Board	17-160-10011023	0
3	SCREW/M2x0.4Px4mm	22-272-20004011	8
4	PRINTER-PCB-MYALR	90-056-02100314	1
5	SCREW/M3x0.5Px5mm	22-242-30005311	4
6	3" Printer (Main body)	52-701-03017003	1
7	Front Cover Assembly	N/A	1
8	Paper Cover Pin	20-004-10011165	1
9	Rotary Damper (15gf-cm)	90-022-09100314	1



ITEM	Description	Part No.	Q'ty
1	STAND PRINTER COVER_F	30-002-02210314	1
2	3" Printer (Main body)	52-701-03017003	1
3	SCREW/T3.0x5mm	22-121-30005011	2

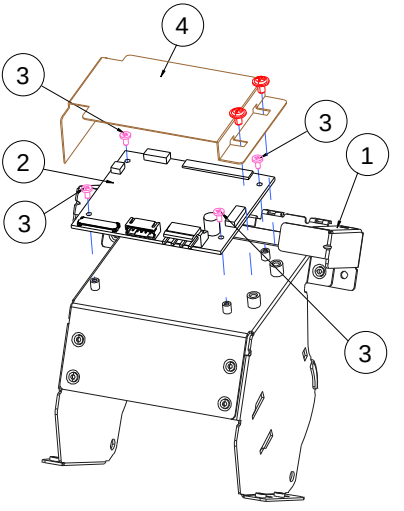
2-Inch Printer



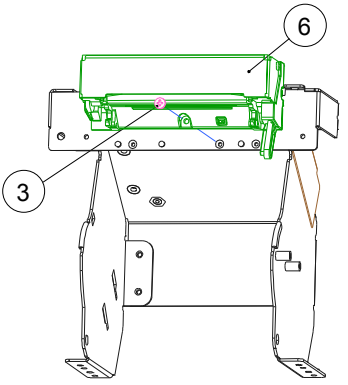
ITEM	Description	Part No.	Q'ty
1	Stand Printer Housing	30-014-28110314	1
2	PS-3100 SPACER SUPPORT (Φ6x25mm)	30-041-04100165	2
3	Roller Pin	20-045-19012199	2
4	Canoe Clip (Φ2.9mm)	90-042-04100000	2

2 Inch Printer Assembly

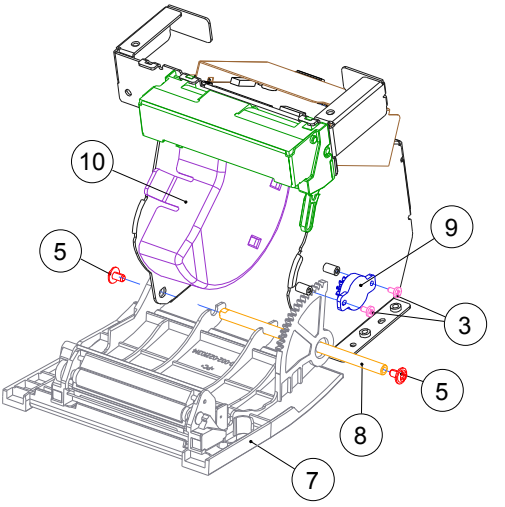
Step-1:



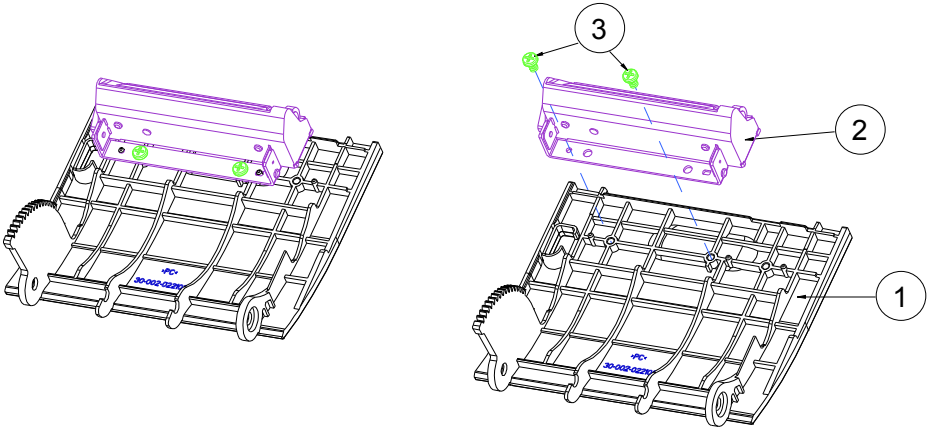
Step-2:



Step-3:

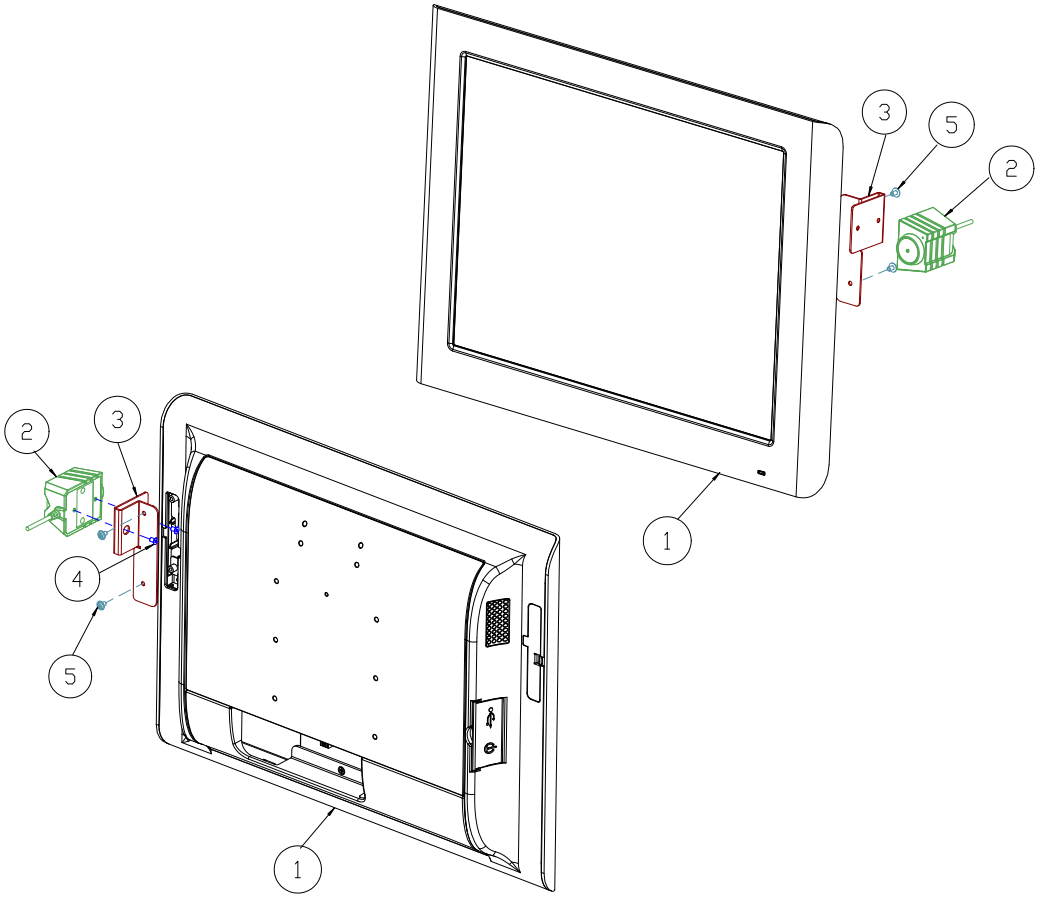


ITEM	Description	Part No.	Q'ty
1	Printer Holder	80-029-03004314	1
2	Printer Board	PDAC3100-D1	1
	Printer Board	MB-1030RB/RC	0
	Printer Board	MB-1011(3)RC	0
3	SCREW/M2x0.4Px4mm	22-272-20004011	7
4	PRINTER-PCB-MYALR	90-056-02100314	1
5	SCREW/M3x0.5Px5mm	22-242-30005311	4
6	2" Printer (Main body)	52-701-01020003	1
7	Front Cover Assembly	N/A	1
8	Paper Cover Pin	20-004-10011165	1
9	Rotary Damper (15gf-cm)	90-022-09100314	1
10	2 inch Paper Block	30-061-28110242	1



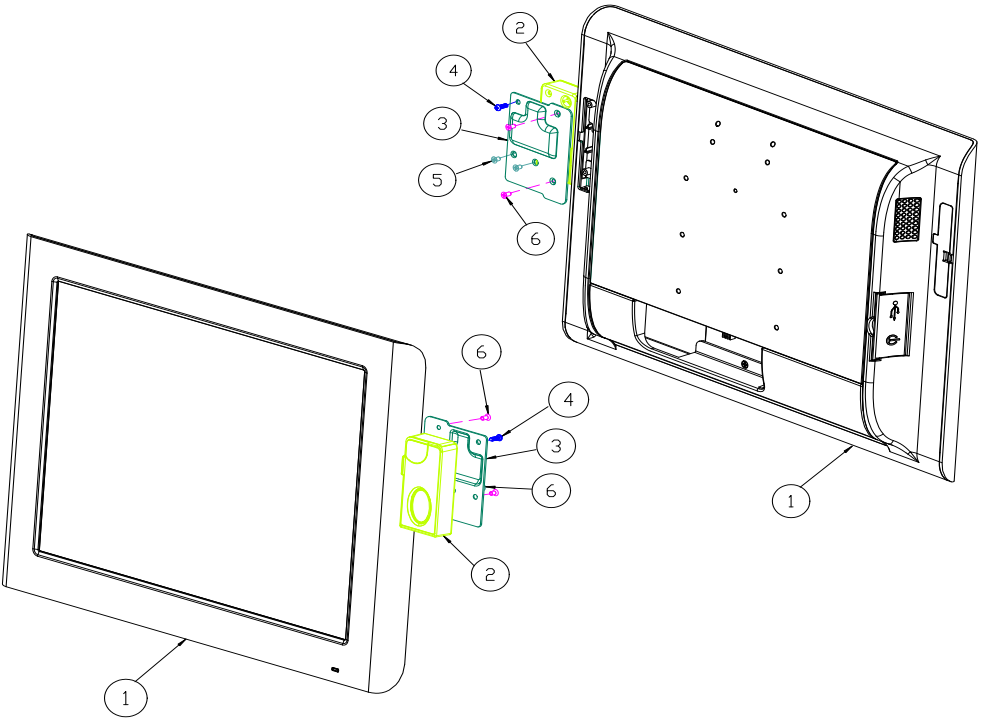
ITEM	Description	Part No.	Q'ty
1	STAND PRINTER COVER_F	30-002-02210314	1
2	2" Printer (Main body)	52-701-01020003	1
3	SCREW/T3.0x5mm	22-121-30005011	2

Exploded Diagrams for Peripheral Devices
Vertical i-Button Kit



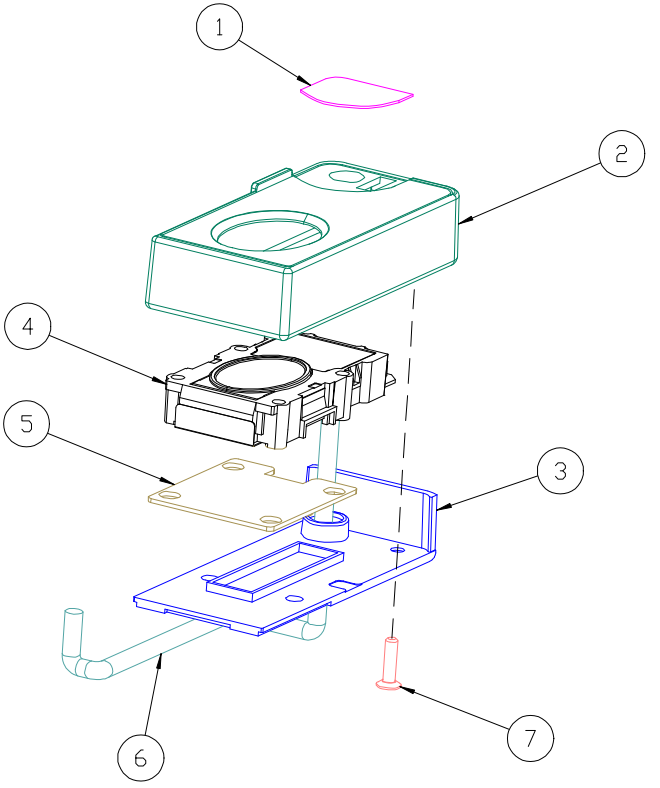
ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC	N/A	1
2	I-button	See Order	1
3	I-Button_Bracket	20-006-03063353	1
4	Flat Head Screw	22-215-30005011	2
5	Round Washer Head Screw	22-235-30007011	2

Vertical Fingerprint Only Kit



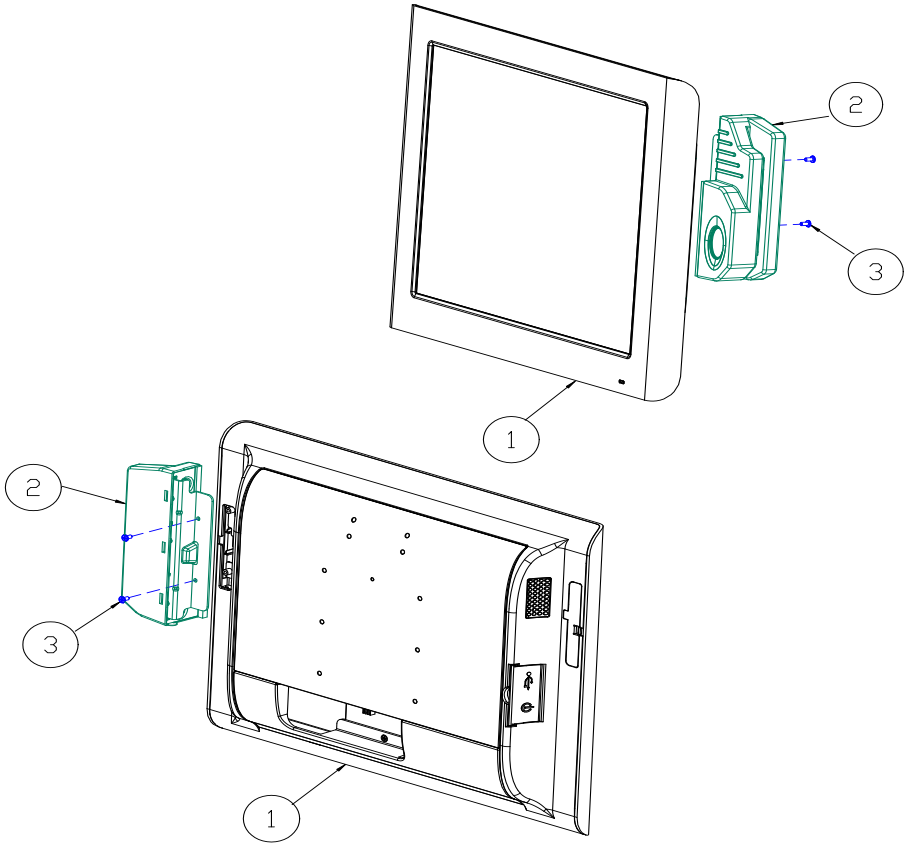
ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC	N/A	1
2	Fingerprint_module	N/A	1
3	Fingerprint Holder	20-029-03061353	1
4	Pan Head Screw	22-122-30080011	1
5	Flat Head Screw	22-215-30005111	2
6	Flat Head Screw	22-215-30006111	2

Fingerprint



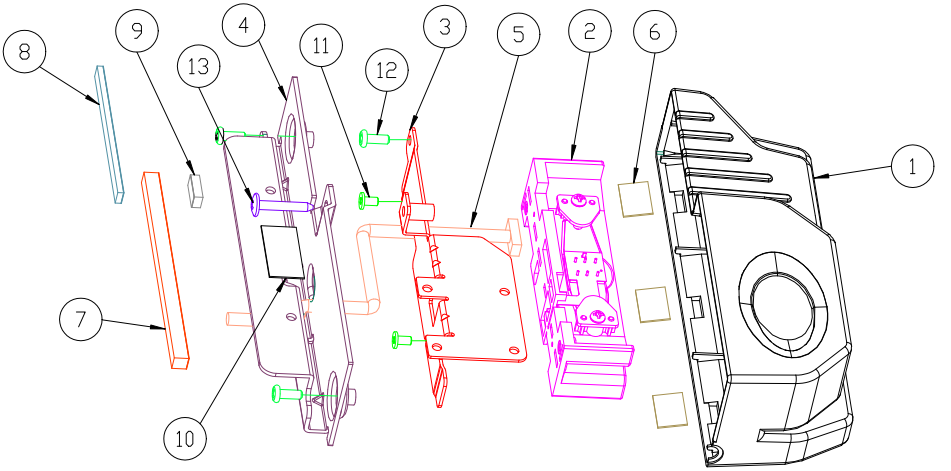
ITEM	Description	Part No.	Q'ty
1	PC_Sheet	N/A	1
2	Fingerprint Top Cover	30-002-12720210	1
3	Fingerprint Btm Cover	30-002-12820210	1
4	Finterprint Module	52-551-00501205	1
5	Fingerprint Bracket	N/A	1
6	Fingerprint Cable	N/A	1
7	Flat Head Screw	22-712-30010011	1

Vertical MSR & Fingerprint Kit



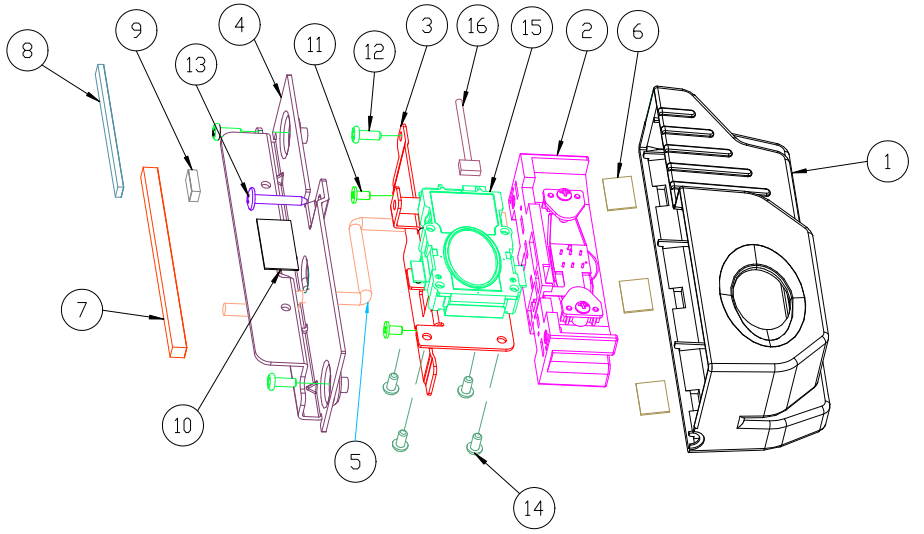
ITEM	Description	Part No.	Q'ty
1	PA-J670_PPC	N/A	1
2	MSR_Finger_Print_Module	N/A	1
3	Fillister Head Screw	22-275-30006011	2

MSR



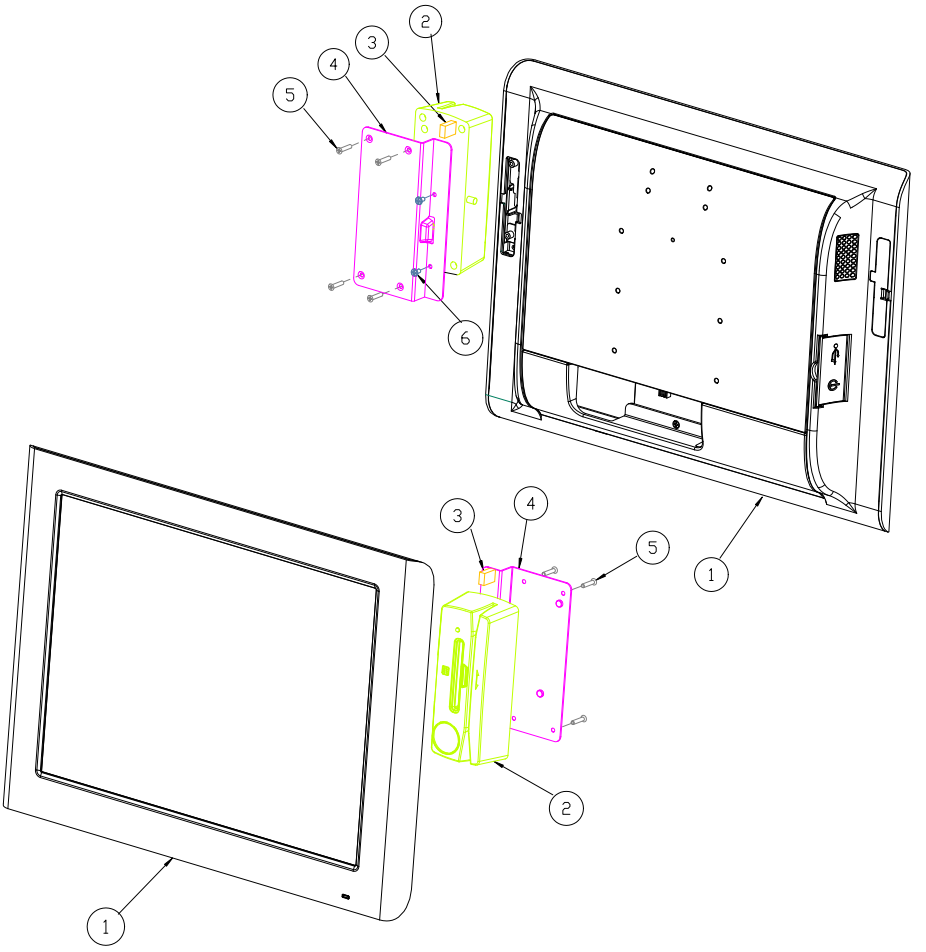
No.	Component Name	P/N No.	Q'ty
1	MSR Main Housing (Close)	90-014-28110181	1
2	PS2 ID TECH MSR	52-151-08333416	1
3	MSR_Bracket	20-006-03001314	1
4	PA-J670 MSR Bracket	20-006-03061353	1
5	MSR Cable	27-014-27402072	1
6	MSR Housing Poron	90-013-24100314	3
7	MSR Bracket EVA-1	90-013-15400353	1
8	MSR Bracket EVA-2	90-013-15200314	1
9	MSR Bracket EVA-3	90-013-15400314	1
10	Plastic Tape	34-008-02002000	0.00015
11	Fillister Head Screw	22-272-30049015	2
12	Round Head Screw	22-135-30008311	3
13	Round Head Screw	22-835-30019011	1

MSR + Fingerprint



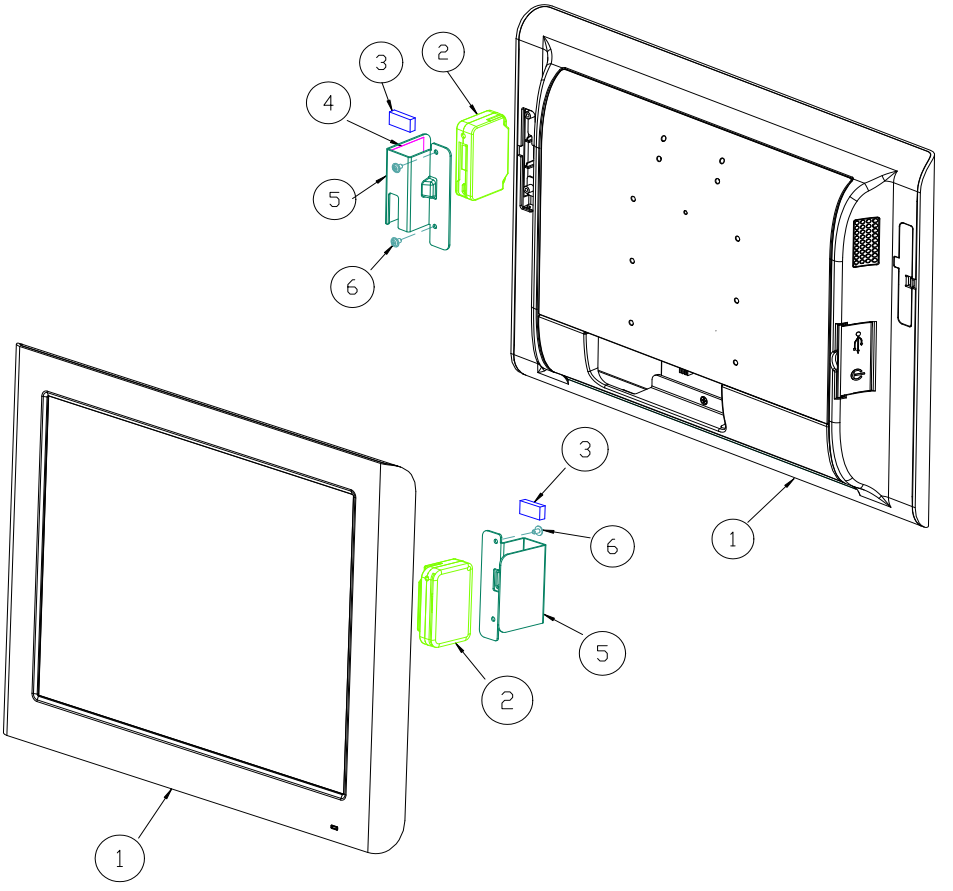
No.	Component Name	P/N No.	Q'ty
1	Fingerprint Housing (Open)	90-014-28310181	1
2	PS2_ID_TECH_MSR	52-151-08333416	1
3	MSR_Bracket	20-006-03001314	1
4	PA-J670 MSR Bracket	20-006-03061353	1
5	MSR Cable	27-014-27402072	1
6	MSR Housing Poron	90-013-24100314	1
7	MSR Bracket EVA-1	90-013-15400353	1
8	MSR Bracket EVA-2	90-013-15200314	1
9	MSR Bracket EVA-3	90-013-15400314	1
10	Plastic Tape	34-008-02002000	0.00015
11	Fillister Head Screw	22-272-30049015	2
12	Round Head Screw	22-135-30008311	3
13	Round Head Screw	22-835-30019011	1
14	Pan Head Screw	22-132-30060011	4
15	USB Fingerprint	52-551-00501205	1
16	Fingerprint Cable	27-004-31404112	1

Vertical RFID, MSR, SMART Card Reader Kit

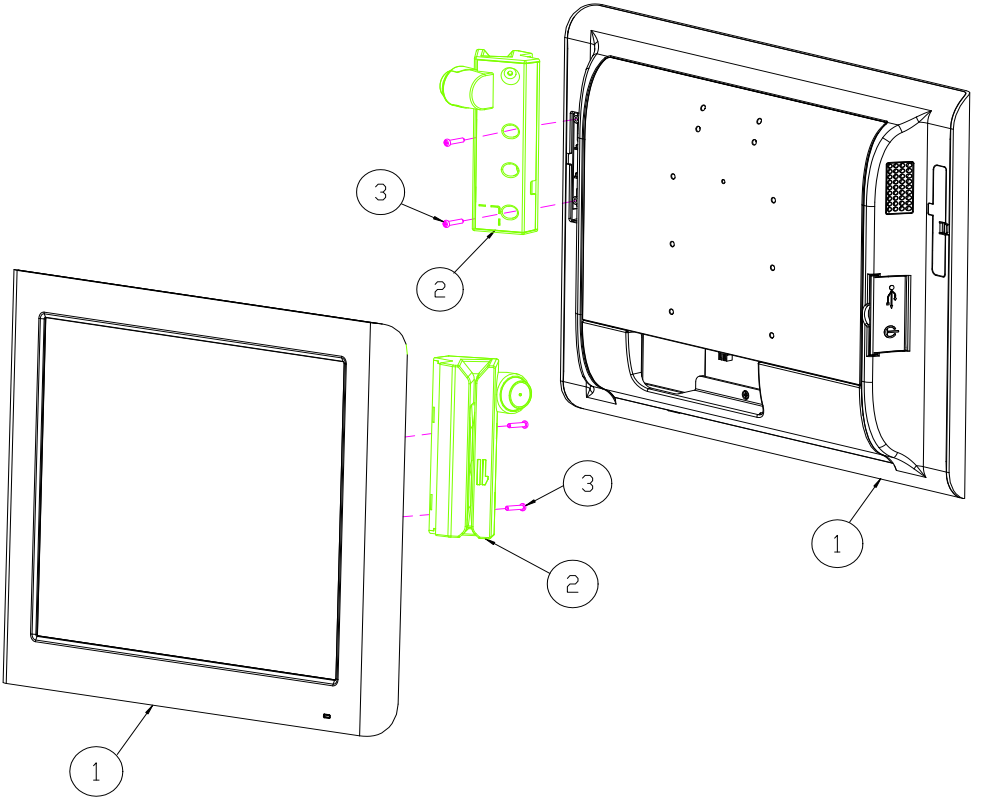


No.	Component Name	P/N No.	Q'ty
1	PA-J670_PPC	N/A	1
2	MSR/RFID Reader Module	See Order	1
3	RFID EVA	90-013-15500353	1
4	RFID_Bracket	20-006-03065353	1
5	Flat Head Screw	22-215-30006111	4
6	Fillister Head Screw	22-215-30006111	2

Vertical SMART Card Reader, MSR Kit

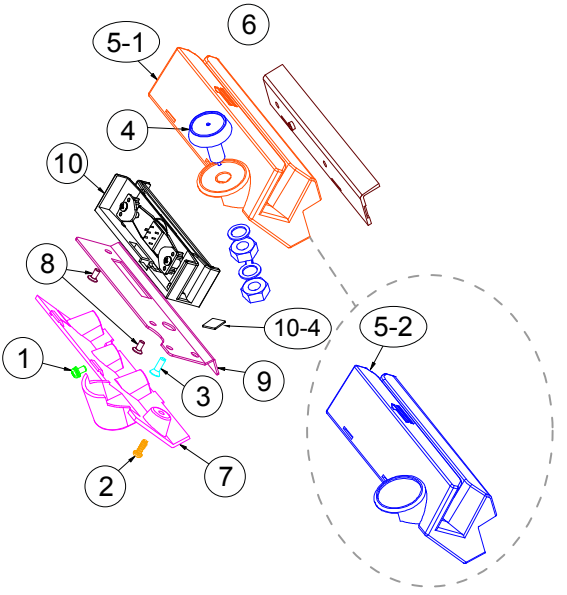


No.	Component Name	P/N No.	Q'ty
1	PA-J670_PPC	N/A	1
2	MSR+Smart Card Reader	See Order	1
3	Smart Card EVA	90-013-15600353	1
4	Smart Card Double Adhesive	94-026-04501353	1
5	Smart Card Bracket	20-006-03064353	1
6	Round Washer Head Screw	22-235-30007011	2



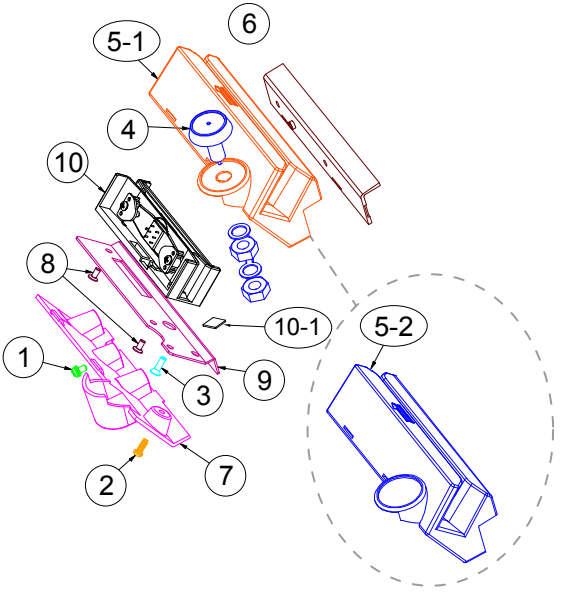
No.	Component Name	P/N No.	Q'ty
1	PA-J670_PPC	N/A	1
2	MSR_Module	N/A	1
3	Round_Screw_M3x14mm	22-232-30014011	2

MSR & i-Button / Single Head



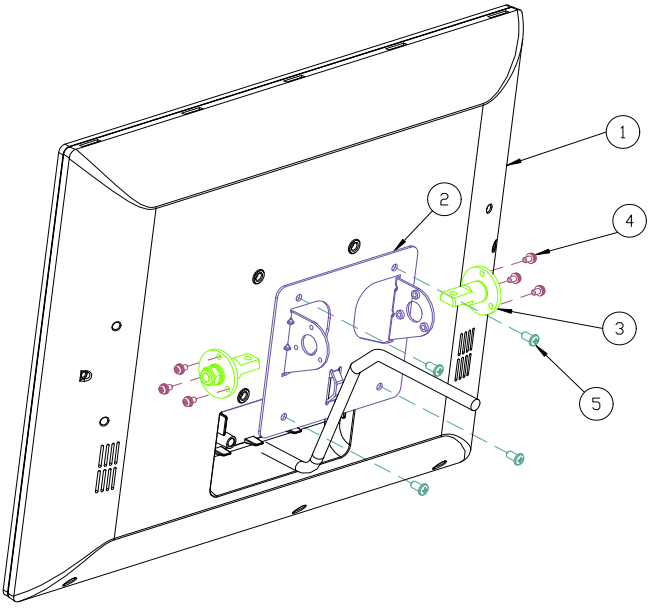
No.	Component Name		P/N No.	Q'ty
1	Round Head with Spring Washer Screw M3x0.5px6mm		22-232-30060211	1
2	Pan Head Screw T3.0x8mm (Black)		22-122-30080011	1
3	Flat Head Screw T3.0x10mm		22-712-30010011	1
4	iButton (IBT100)		52-551-00100002	1
5	5-1	MSR Top Housing-1	30-014-12310210	1
	5-2	MSR Top Housing-2	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_P32	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	-

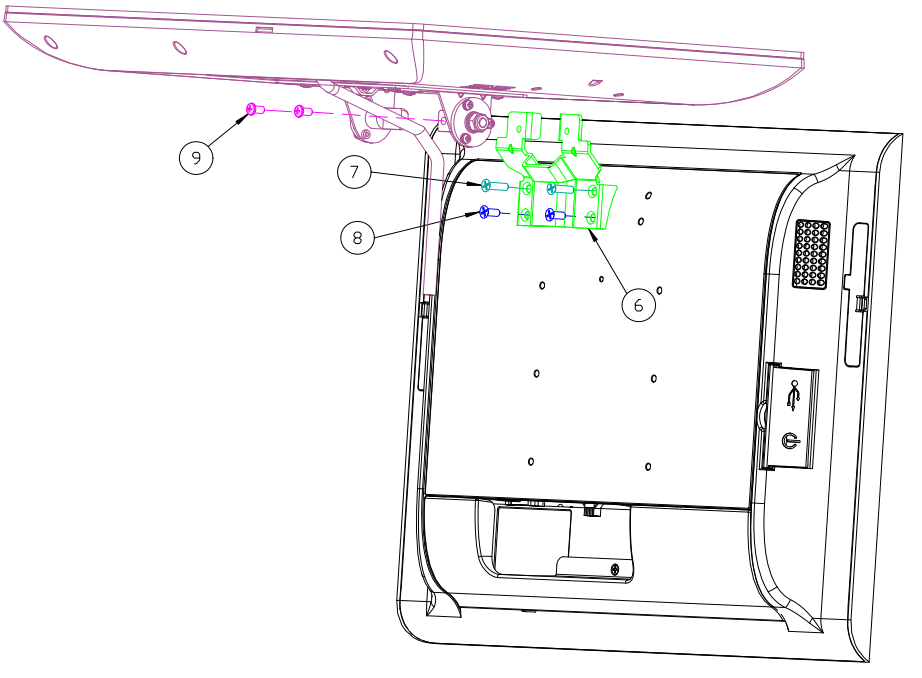
MSR & i-Button / Twin Head



No.	Component Name	P/N No.	Q'ty
1	Round Head with Spring Washer Screw M3x0.5Px6mm	22-232-30080211	1
2	Pan Head Screw T3.0x8mm(Black)	22-122-30080011	1
3	Flat Head Screw T3.0x10mm	22-712-30010011	1
4	I Button Reader Sysking IBT100	52-551-00100002	1
5-1	PA-3151 MSR Top Housing (I-BUTTON)-1 (Black)	30-014-12510210	1
5-2	PA-3151 MSR Top Housing (Black)	30-014-12110210	1
6	POD-3520 MSR Cover Side-1 (Black)	30-002-12122210	1
7	POD-3520 MSR BTM Cover-1 (Black)	30-002-12020210	1
8	Flat Head Screw M3x0.5Px6mm (Black)	22-215-30060011	2
9	PA-3151 MSR Fixer Bracket	20-006-03006210	1
10	Twin Head MSR, RS-232, GIGA-TMS MJR243R-10(F/W V1.01)	52-551-00243100	1
10	MSR for M/B cable (PB-6722 COM4_1)	N/A	1
	MSR for to itself cable	N/A	1
	IBUTTON for M/B cable (PB-6722 I-BUT)	N/A	1
	IBUTTON for itself cable	N/A	1
10-1	PA-6225 Mylar Sheet for MSR	30-056-02100336	1

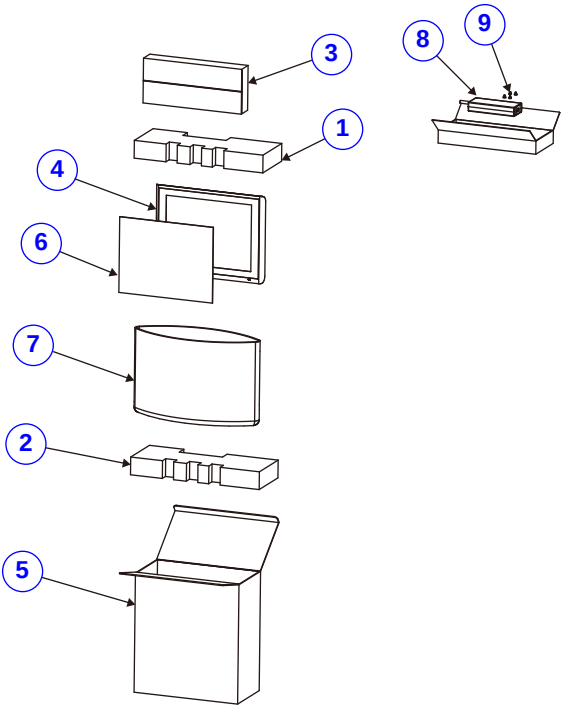
Second Display





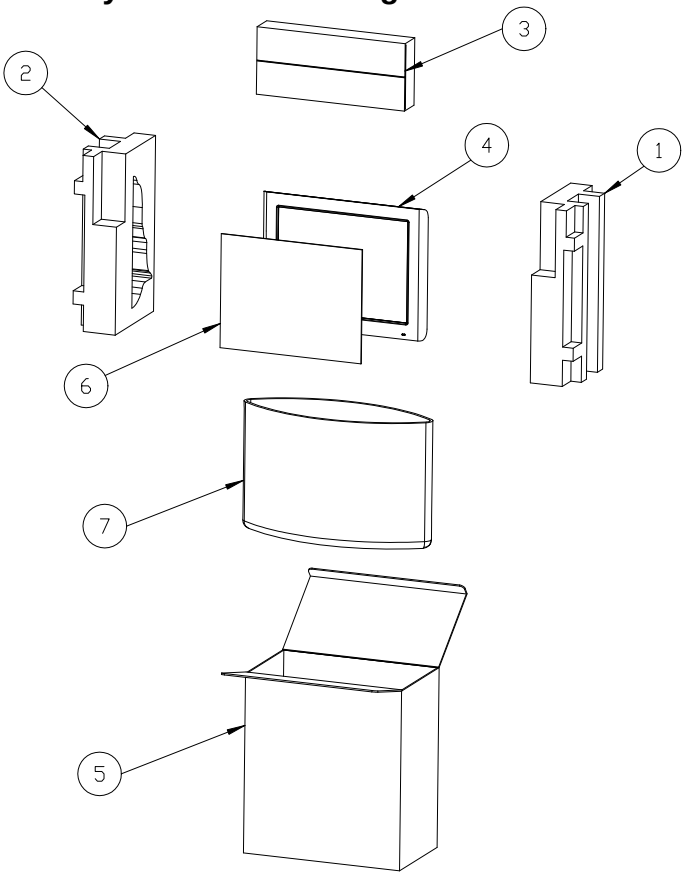
ITEM	Description	Part No.	Q'ty
1	15" TFT LCD VGA Monitor	See Order	1
2	2nd_Dis_Hinge_Bracket	20-006-03062353	1
3	2nd Display Hinge	20-006-03062353	2
4	Round Head Screw	22-235-30008011	6
5	Round Head Screw	22-245-40008011	4
6	2nd_Dis_Hinge_Base	20-032-03061353	1
7	Flat Head Screw	22-215-40015011	2
8	Flat Head Screw	22-215-40010011	2
9	Round Head Screw	22-245-40008011	2

Exploded Diagrams for Packing
PPC Package Exploded Diagram



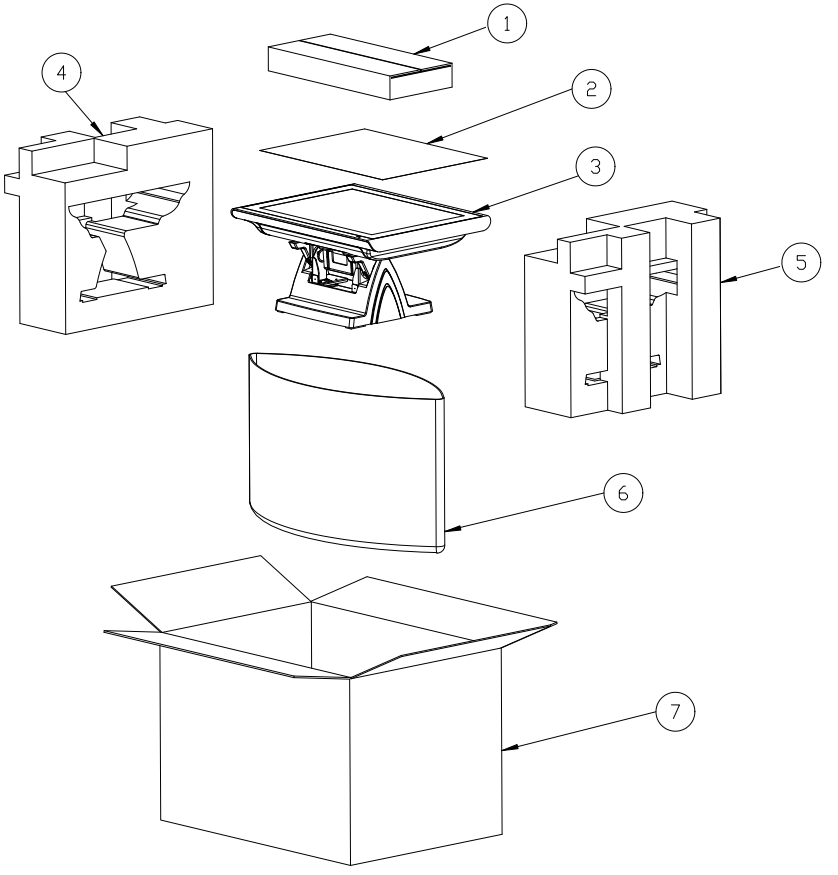
ITEM	Description	Part No.	Q'ty
1	PA-J670 EPE Top (PPC Type) (496x183x139mm)	94-016-00301353	1
2	PA-J670 EPE Bottom (PPC Type) (496x183x172mm)	94-016-00302353	1
3	PS-650X Carton Boxes (332x150x45mm)	34-003-01301086	1
4	PA-J670 PPC	N/A	1
5	PA-6922 Inner Carton (453x176x366mm)	94-002-01201269	1
6	MYLAR 335x260x0.125	30-056-02100008	1
7	PE Bag 480X460 (42x56cmx0.07)	32-10020010000	1
8	60W AC to DC 24V/2.5A Power Adaptor (w/Lock)	52-002-10068302	1
9	Fillister Head Screw M4x0.7Px4mm	22-272-40004911	4

Easy Stand System with Packing



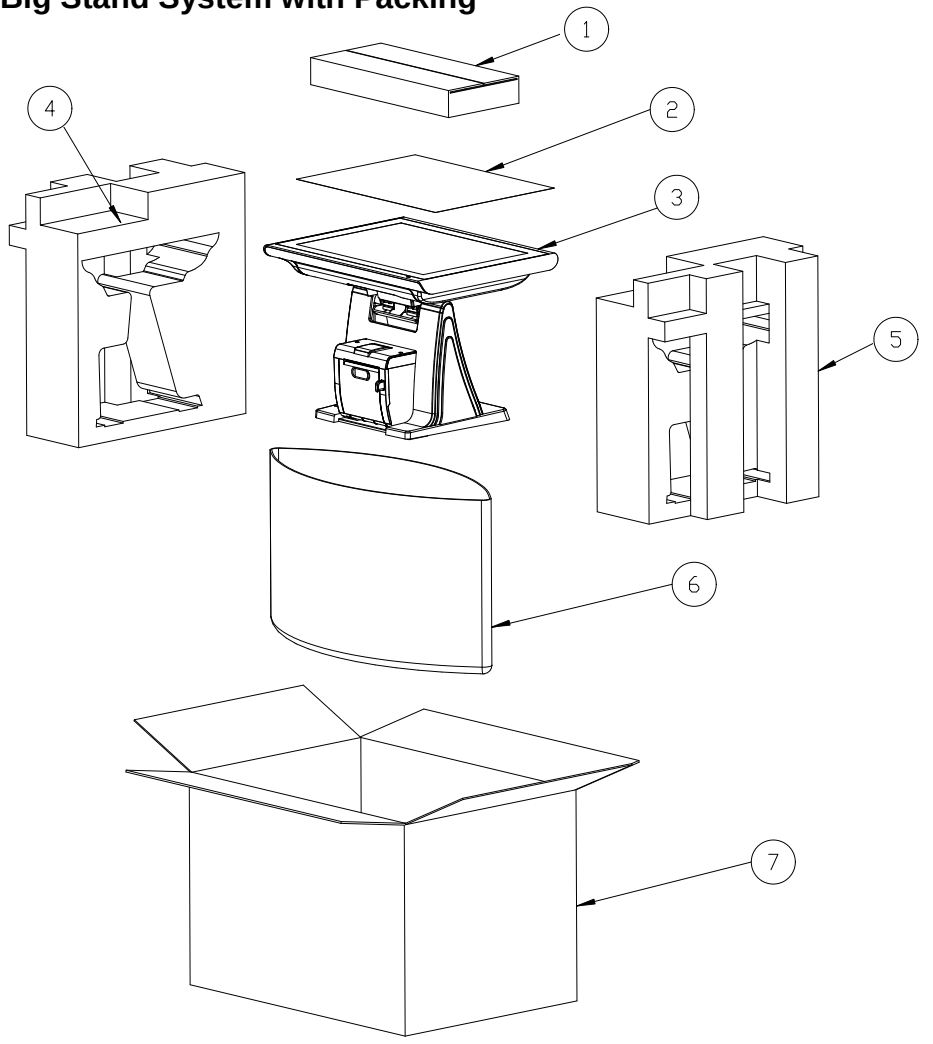
No.	Component Name	P/N No.	Q'ty
1	EPE Right	94-016-00307353	1
2	EPE Left	94-016-00308353	1
3	Accessories Box	34-003-01301086	1
4	PA-J670 Model	N/A	1
5	Outer Carton (PPC Type)	94-001-01404353	1
6	Mylar	30-056-02100008	1
7	PE Bag	32-100-20010000	1

Normal Stand System with Packing



No.	Component 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-J670 Model	N/A	1
4	EPE Left	94-016-00304353	1
5	EPE Right	94-016-00303353	1
6	PE Bag (850X670X0.07mm)	34-010-00210003	1
7	PA-J670 Outer Carton	94-001-01402353	1

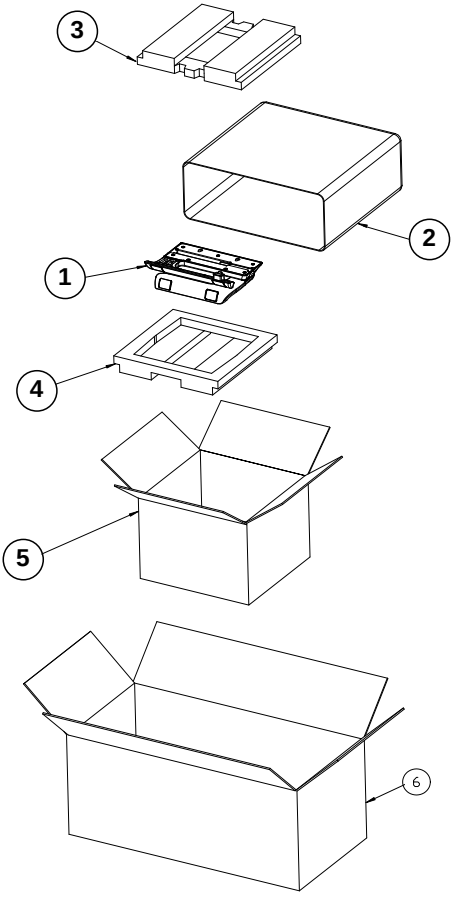
Big Stand System with Packing



No.	Component 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-J670_model	N/A	1
4	PA-J670 EPE Left	94-016-00306353	1
5	PA-J670 EPE Right	94-016-00305353	1
6	PE Bag (850x670x0.07mm)	34-010-00210003	1
7	PA-J670 Outer Carton	94-001-01403353	1

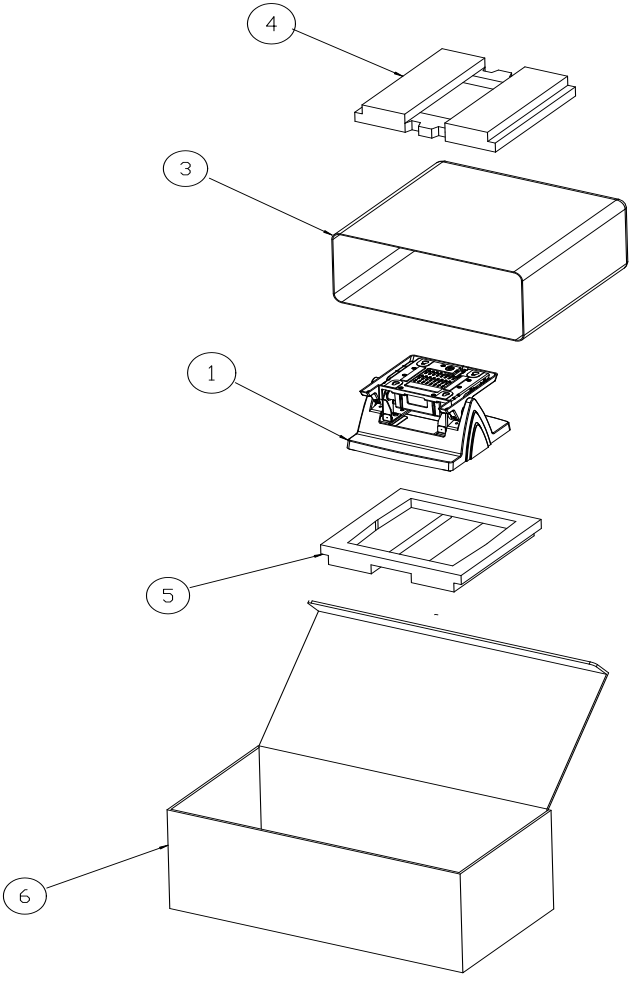
Exploded Diagrams for Spare Parts

Easy Stand Spare Parts



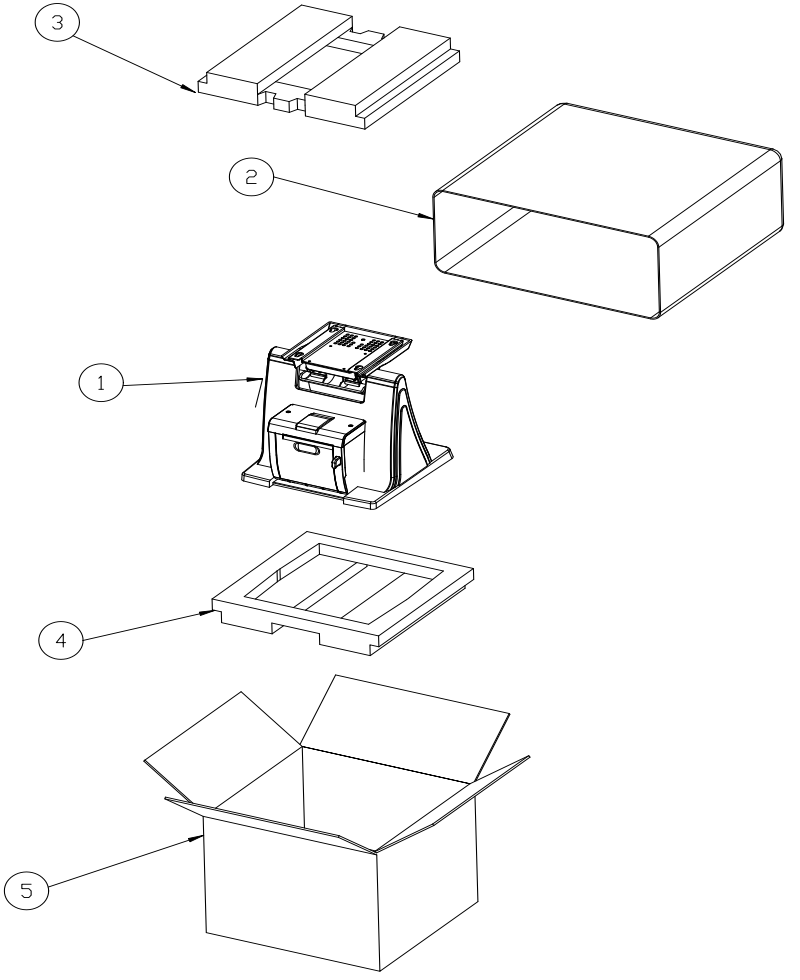
ITEM	Description	Part No.	Q'ty
1	Easy Stand Service Pack	N/A	1
2	Package Bag 480x460mm	32-100-20010000	1
3	EPE Top	94-016-00311353	1
4	EPE Bottom	94-016-00312353	1
5	Inner Carton	94-002-01401353	1
6	Outer Carton	94-001-01407353	0.5

Normal Stand Spare Parts



ITEM	Description	Part No.	Q'ty
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

Printer Stand Spare Parts



ITEM	Description	Part No.	Q'ty
1	Printer 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	94-010-01405353	1

Appendix B Technical Summary

This appendix will give you a brief introduction of the allocation maps for the system resources.

The following topics are included:

- Interrupt Map
- DMA Channels Map
- I/O Map
- Memory Map
- Configuring WatchDog Timer
- Flash BIOS Update

Interrupt Map

IRQ	ASSIGNMENT
IRQ 0	System timer
IRQ 3	Intel SD Host Controller
IRQ 4	Communications Port (COM1)
IRQ 6	Communications Port (COM2)
IRQ 7	Communications Port (COM3)
IRQ 8	System CMOS/real time clock
IRQ 10	Communications Port (COM4)
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT3452
IRQ 25	High Definition Audio Controller
IRQ 31	Intel(R) Serial IO I2C Host Controller - 5AB4
IRQ 32	Intel(R) Serial IO I2C Host Controller - 5AB6
IRQ 54	Microsoft ACPI-Compliant System
IRQ 55	Microsoft ACPI-Compliant System
IRQ 56	Microsoft ACPI-Compliant System
IRQ 57	Microsoft ACPI-Compliant System
IRQ 58	Microsoft ACPI-Compliant System
IRQ 59	Microsoft ACPI-Compliant System
IRQ 60	Microsoft ACPI-Compliant System
IRQ 61	Microsoft ACPI-Compliant System
IRQ 62	Microsoft ACPI-Compliant System
IRQ 63	Microsoft ACPI-Compliant System
IRQ 64	Microsoft ACPI-Compliant System
IRQ 65	Microsoft ACPI-Compliant System
IRQ 66	Microsoft ACPI-Compliant System
IRQ 67	Microsoft ACPI-Compliant System
IRQ 68	Microsoft ACPI-Compliant System
IRQ 69	Microsoft ACPI-Compliant System
IRQ 70	Microsoft ACPI-Compliant System
IRQ 71	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 72	Microsoft ACPI-Compliant System
IRQ 73	Microsoft ACPI-Compliant System
IRQ 74	Microsoft ACPI-Compliant System
IRQ 75	Microsoft ACPI-Compliant System
IRQ 76	Microsoft ACPI-Compliant System
IRQ 77	Microsoft ACPI-Compliant System
IRQ 78	Microsoft ACPI-Compliant System
IRQ 79	Microsoft ACPI-Compliant System
IRQ 80	Microsoft ACPI-Compliant System
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 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	ASSIGNMENT
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 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	ASSIGNMENT
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 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	ASSIGNMENT
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 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 191	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 192	Microsoft ACPI-Compliant System
IRQ 193	Microsoft ACPI-Compliant System
IRQ 194	Microsoft ACPI-Compliant System
IRQ 195	Microsoft ACPI-Compliant System
IRQ 196	Microsoft ACPI-Compliant System
IRQ 197	Microsoft ACPI-Compliant System
IRQ 198	Microsoft ACPI-Compliant System
IRQ 199	Microsoft ACPI-Compliant System
IRQ 200	Microsoft ACPI-Compliant System
IRQ 201	Microsoft ACPI-Compliant System
IRQ 202	Microsoft ACPI-Compliant System
IRQ 203	Microsoft ACPI-Compliant System
IRQ 204	Microsoft ACPI-Compliant System
IRQ 256	Microsoft ACPI-Compliant System
IRQ 257	Microsoft ACPI-Compliant System
IRQ 258	Microsoft ACPI-Compliant System
IRQ 259	Microsoft ACPI-Compliant System
IRQ 260	Microsoft ACPI-Compliant System
IRQ 261	Microsoft ACPI-Compliant System
IRQ 262	Microsoft ACPI-Compliant System
IRQ 263	Microsoft ACPI-Compliant System
IRQ 264	Microsoft ACPI-Compliant System
IRQ 265	Microsoft ACPI-Compliant System
IRQ 266	Microsoft ACPI-Compliant System
IRQ 267	Microsoft ACPI-Compliant System
IRQ 268	Microsoft ACPI-Compliant System
IRQ 269	Microsoft ACPI-Compliant System
IRQ 270	Microsoft ACPI-Compliant System
IRQ 271	Microsoft ACPI-Compliant System
IRQ 272	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 273	Microsoft ACPI-Compliant System
IRQ 274	Microsoft ACPI-Compliant System
IRQ 275	Microsoft ACPI-Compliant System
IRQ 276	Microsoft ACPI-Compliant System
IRQ 277	Microsoft ACPI-Compliant System
IRQ 278	Microsoft ACPI-Compliant System
IRQ 279	Microsoft ACPI-Compliant System
IRQ 280	Microsoft ACPI-Compliant System
IRQ 281	Microsoft ACPI-Compliant System
IRQ 282	Microsoft ACPI-Compliant System
IRQ 283	Microsoft ACPI-Compliant System
IRQ 284	Microsoft ACPI-Compliant System
IRQ 285	Microsoft ACPI-Compliant System
IRQ 286	Microsoft ACPI-Compliant System
IRQ 287	Microsoft ACPI-Compliant System
IRQ 288	Microsoft ACPI-Compliant System
IRQ 289	Microsoft ACPI-Compliant System
IRQ 290	Microsoft ACPI-Compliant System
IRQ 291	Microsoft ACPI-Compliant System
IRQ 292	Microsoft ACPI-Compliant System
IRQ 293	Microsoft ACPI-Compliant System
IRQ 294	Microsoft ACPI-Compliant System
IRQ 295	Microsoft ACPI-Compliant System
IRQ 296	Microsoft ACPI-Compliant System
IRQ 297	Microsoft ACPI-Compliant System
IRQ 298	Microsoft ACPI-Compliant System
IRQ 299	Microsoft ACPI-Compliant System
IRQ 300	Microsoft ACPI-Compliant System
IRQ 301	Microsoft ACPI-Compliant System
IRQ 302	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 303	Microsoft ACPI-Compliant System
IRQ 304	Microsoft ACPI-Compliant System
IRQ 305	Microsoft ACPI-Compliant System
IRQ 306	Microsoft ACPI-Compliant System
IRQ 307	Microsoft ACPI-Compliant System
IRQ 308	Microsoft ACPI-Compliant System
IRQ 309	Microsoft ACPI-Compliant System
IRQ 310	Microsoft ACPI-Compliant System
IRQ 311	Microsoft ACPI-Compliant System
IRQ 312	Microsoft ACPI-Compliant System
IRQ 313	Microsoft ACPI-Compliant System
IRQ 314	Microsoft ACPI-Compliant System
IRQ 315	Microsoft ACPI-Compliant System
IRQ 316	Microsoft ACPI-Compliant System
IRQ 317	Microsoft ACPI-Compliant System
IRQ 318	Microsoft ACPI-Compliant System
IRQ 319	Microsoft ACPI-Compliant System
IRQ 320	Microsoft ACPI-Compliant System
IRQ 321	Microsoft ACPI-Compliant System
IRQ 322	Microsoft ACPI-Compliant System
IRQ 323	Microsoft ACPI-Compliant System
IRQ 324	Microsoft ACPI-Compliant System
IRQ 325	Microsoft ACPI-Compliant System
IRQ 326	Microsoft ACPI-Compliant System
IRQ 327	Microsoft ACPI-Compliant System
IRQ 328	Microsoft ACPI-Compliant System
IRQ 329	Microsoft ACPI-Compliant System
IRQ 330	Microsoft ACPI-Compliant System
IRQ 331	Microsoft ACPI-Compliant System
IRQ 332	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 333	Microsoft ACPI-Compliant System
IRQ 334	Microsoft ACPI-Compliant System
IRQ 335	Microsoft ACPI-Compliant System
IRQ 336	Microsoft ACPI-Compliant System
IRQ 337	Microsoft ACPI-Compliant System
IRQ 338	Microsoft ACPI-Compliant System
IRQ 339	Microsoft ACPI-Compliant System
IRQ 340	Microsoft ACPI-Compliant System
IRQ 341	Microsoft ACPI-Compliant System
IRQ 342	Microsoft ACPI-Compliant System
IRQ 343	Microsoft ACPI-Compliant System
IRQ 344	Microsoft ACPI-Compliant System
IRQ 345	Microsoft ACPI-Compliant System
IRQ 346	Microsoft ACPI-Compliant System
IRQ 347	Microsoft ACPI-Compliant System
IRQ 348	Microsoft ACPI-Compliant System
IRQ 349	Microsoft ACPI-Compliant System
IRQ 350	Microsoft ACPI-Compliant System
IRQ 351	Microsoft ACPI-Compliant System
IRQ 352	Microsoft ACPI-Compliant System
IRQ 353	Microsoft ACPI-Compliant System
IRQ 354	Microsoft ACPI-Compliant System
IRQ 355	Microsoft ACPI-Compliant System
IRQ 356	Microsoft ACPI-Compliant System
IRQ 357	Microsoft ACPI-Compliant System
IRQ 358	Microsoft ACPI-Compliant System
IRQ 359	Microsoft ACPI-Compliant System
IRQ 360	Microsoft ACPI-Compliant System
IRQ 361	Microsoft ACPI-Compliant System
IRQ 362	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 363	Microsoft ACPI-Compliant System
IRQ 364	Microsoft ACPI-Compliant System
IRQ 365	Microsoft ACPI-Compliant System
IRQ 366	Microsoft ACPI-Compliant System
IRQ 367	Microsoft ACPI-Compliant System
IRQ 368	Microsoft ACPI-Compliant System
IRQ 369	Microsoft ACPI-Compliant System
IRQ 370	Microsoft ACPI-Compliant System
IRQ 371	Microsoft ACPI-Compliant System
IRQ 372	Microsoft ACPI-Compliant System
IRQ 373	Microsoft ACPI-Compliant System
IRQ 374	Microsoft ACPI-Compliant System
IRQ 375	Microsoft ACPI-Compliant System
IRQ 376	Microsoft ACPI-Compliant System
IRQ 377	Microsoft ACPI-Compliant System
IRQ 378	Microsoft ACPI-Compliant System
IRQ 379	Microsoft ACPI-Compliant System
IRQ 380	Microsoft ACPI-Compliant System
IRQ 381	Microsoft ACPI-Compliant System
IRQ 382	Microsoft ACPI-Compliant System
IRQ 383	Microsoft ACPI-Compliant System
IRQ 384	Microsoft ACPI-Compliant System
IRQ 385	Microsoft ACPI-Compliant System
IRQ 386	Microsoft ACPI-Compliant System
IRQ 387	Microsoft ACPI-Compliant System
IRQ 388	Microsoft ACPI-Compliant System
IRQ 389	Microsoft ACPI-Compliant System
IRQ 390	Microsoft ACPI-Compliant System
IRQ 391	Microsoft ACPI-Compliant System
IRQ 392	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 393	Microsoft ACPI-Compliant System
IRQ 394	Microsoft ACPI-Compliant System
IRQ 395	Microsoft ACPI-Compliant System
IRQ 396	Microsoft ACPI-Compliant System
IRQ 397	Microsoft ACPI-Compliant System
IRQ 398	Microsoft ACPI-Compliant System
IRQ 399	Microsoft ACPI-Compliant System
IRQ 400	Microsoft ACPI-Compliant System
IRQ 401	Microsoft ACPI-Compliant System
IRQ 402	Microsoft ACPI-Compliant System
IRQ 403	Microsoft ACPI-Compliant System
IRQ 404	Microsoft ACPI-Compliant System
IRQ 405	Microsoft ACPI-Compliant System
IRQ 406	Microsoft ACPI-Compliant System
IRQ 407	Microsoft ACPI-Compliant System
IRQ 408	Microsoft ACPI-Compliant System
IRQ 409	Microsoft ACPI-Compliant System
IRQ 410	Microsoft ACPI-Compliant System
IRQ 411	Microsoft ACPI-Compliant System
IRQ 412	Microsoft ACPI-Compliant System
IRQ 413	Microsoft ACPI-Compliant System
IRQ 414	Microsoft ACPI-Compliant System
IRQ 415	Microsoft ACPI-Compliant System
IRQ 416	Microsoft ACPI-Compliant System
IRQ 417	Microsoft ACPI-Compliant System
IRQ 418	Microsoft ACPI-Compliant System
IRQ 419	Microsoft ACPI-Compliant System
IRQ 420	Microsoft ACPI-Compliant System
IRQ 421	Microsoft ACPI-Compliant System
IRQ 422	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 423	Microsoft ACPI-Compliant System
IRQ 424	Microsoft ACPI-Compliant System
IRQ 425	Microsoft ACPI-Compliant System
IRQ 426	Microsoft ACPI-Compliant System
IRQ 427	Microsoft ACPI-Compliant System
IRQ 428	Microsoft ACPI-Compliant System
IRQ 429	Microsoft ACPI-Compliant System
IRQ 430	Microsoft ACPI-Compliant System
IRQ 431	Microsoft ACPI-Compliant System
IRQ 432	Microsoft ACPI-Compliant System
IRQ 433	Microsoft ACPI-Compliant System
IRQ 434	Microsoft ACPI-Compliant System
IRQ 435	Microsoft ACPI-Compliant System
IRQ 436	Microsoft ACPI-Compliant System
IRQ 437	Microsoft ACPI-Compliant System
IRQ 438	Microsoft ACPI-Compliant System
IRQ 439	Microsoft ACPI-Compliant System
IRQ 440	Microsoft ACPI-Compliant System
IRQ 441	Microsoft ACPI-Compliant System
IRQ 442	Microsoft ACPI-Compliant System
IRQ 443	Microsoft ACPI-Compliant System
IRQ 444	Microsoft ACPI-Compliant System
IRQ 445	Microsoft ACPI-Compliant System
IRQ 446	Microsoft ACPI-Compliant System
IRQ 447	Microsoft ACPI-Compliant System
IRQ 448	Microsoft ACPI-Compliant System
IRQ 449	Microsoft ACPI-Compliant System
IRQ 450	Microsoft ACPI-Compliant System
IRQ 451	Microsoft ACPI-Compliant System
IRQ 452	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 453	Microsoft ACPI-Compliant System
IRQ 454	Microsoft ACPI-Compliant System
IRQ 455	Microsoft ACPI-Compliant System
IRQ 456	Microsoft ACPI-Compliant System
IRQ 457	Microsoft ACPI-Compliant System
IRQ 458	Microsoft ACPI-Compliant System
IRQ 459	Microsoft ACPI-Compliant System
IRQ 460	Microsoft ACPI-Compliant System
IRQ 461	Microsoft ACPI-Compliant System
IRQ 462	Microsoft ACPI-Compliant System
IRQ 463	Microsoft ACPI-Compliant System
IRQ 464	Microsoft ACPI-Compliant System
IRQ 465	Microsoft ACPI-Compliant System
IRQ 466	Microsoft ACPI-Compliant System
IRQ 467	Microsoft ACPI-Compliant System
IRQ 468	Microsoft ACPI-Compliant System
IRQ 469	Microsoft ACPI-Compliant System
IRQ 470	Microsoft ACPI-Compliant System
IRQ 471	Microsoft ACPI-Compliant System
IRQ 472	Microsoft ACPI-Compliant System
IRQ 473	Microsoft ACPI-Compliant System
IRQ 474	Microsoft ACPI-Compliant System
IRQ 475	Microsoft ACPI-Compliant System
IRQ 476	Microsoft ACPI-Compliant System
IRQ 477	Microsoft ACPI-Compliant System
IRQ 478	Microsoft ACPI-Compliant System
IRQ 479	Microsoft ACPI-Compliant System
IRQ 480	Microsoft ACPI-Compliant System
IRQ 481	Microsoft ACPI-Compliant System
IRQ 482	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
IRQ 483	Microsoft ACPI-Compliant System
IRQ 484	Microsoft ACPI-Compliant System
IRQ 485	Microsoft ACPI-Compliant System
IRQ 486	Microsoft ACPI-Compliant System
IRQ 487	Microsoft ACPI-Compliant System
IRQ 488	Microsoft ACPI-Compliant System
IRQ 489	Microsoft ACPI-Compliant System
IRQ 490	Microsoft ACPI-Compliant System
IRQ 491	Microsoft ACPI-Compliant System
IRQ 492	Microsoft ACPI-Compliant System
IRQ 493	Microsoft ACPI-Compliant System
IRQ 494	Microsoft ACPI-Compliant System
IRQ 495	Microsoft ACPI-Compliant System
IRQ 496	Microsoft ACPI-Compliant System
IRQ 497	Microsoft ACPI-Compliant System
IRQ 498	Microsoft ACPI-Compliant System
IRQ 499	Microsoft ACPI-Compliant System
IRQ 500	Microsoft ACPI-Compliant System
IRQ 501	Microsoft ACPI-Compliant System
IRQ 502	Microsoft ACPI-Compliant System
IRQ 503	Microsoft ACPI-Compliant System
IRQ 504	Microsoft ACPI-Compliant System
IRQ 505	Microsoft ACPI-Compliant System
IRQ 506	Microsoft ACPI-Compliant System
IRQ 507	Microsoft ACPI-Compliant System
IRQ 508	Microsoft ACPI-Compliant System
IRQ 509	Microsoft ACPI-Compliant System
IRQ 510	Microsoft ACPI-Compliant System
IRQ 511	Microsoft ACPI-Compliant System
IRQ 1024	Intel SD Host Controller

IRQ	ASSIGNMENT
IRQ 4294967277	Intel(R) HD Graphics
IRQ 4294967278	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967279	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967280	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967281	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967282	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967283	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967284	Intel(R) I210 Gigabit Network Connection
IRQ 4294967285	Intel(R) I210 Gigabit Network Connection
IRQ 4294967286	Intel(R) I210 Gigabit Network Connection
IRQ 4294967287	Intel(R) I210 Gigabit Network Connection
IRQ 4294967288	Intel(R) I210 Gigabit Network Connection
IRQ 4294967289	Intel(R) I210 Gigabit Network Connection
IRQ 4294967290	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967291	Intel(R) Trusted Execution Engine Interface
IRQ 4294967292	Standard SATA AHCI Controller
IRQ 4294967293	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
IRQ 4294967294	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8

Note: The resource information is gathered using Windows 10 (the IRQs could be assigned differently depending on your OS).

I/O MAP

I/O	ASSIGNMENT
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000400-0x0000047F	Motherboard resources
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x0000F040-0x0000F05F	Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
0x0000D000-0x0000DFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x0000F000-0x0000F03F	Intel(R) HD Graphics
0x0000E000-0x0000EFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
0x00000000-0x0000006F	PCI Express Root Complex
0x00000078-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller

I/O	ASSIGNMENT
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F060-0x0000F07F	Standard SATA AHCI Controller
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer

Memory Map

MEMORY MAP	ASSIGNMENT
0xE0000000-0xEFFFFFFF	Motherboard resources
0xE0000000-0xEFFFFFFF	PCI Express Root Complex
0xFEA00000-0xFEAFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED06000-0xFED06FFF	Motherboard resources
0xFED08000-0xFED09FFF	Motherboard resources
0xFED80000-0xFEDBFFFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0x91310000-0x91313FFF	High Definition Audio Controller
0x91000000-0x910FFFFF	High Definition Audio Controller
0x91316000-0x913160FF	Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
0x91180000-0x911FFFFF	Intel(R) I210 Gigabit Network Connection
0x9117C000-0x9117FFFF	Intel(R) I210 Gigabit Network Connection
0x91100000-0x911FFFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
0x9131C000-0x9131CFFF	Intel(R) Serial IO I2C Host Controller - 5AB4
0x9131B000-0x9131BFFF	Intel(R) Serial IO I2C Host Controller - 5AB4
0xFED00000-0xFED003FF	High precision event timer
0x91300000-0x9130FFFF	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
0x90000000-0x90FFFFFF	Intel(R) HD Graphics
0x80000000-0x8FFFFFFF	Intel(R) HD Graphics
0x80000000-0x8FFFFFFF	PCI Express Root Complex
0x91200000-0x912FFFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
0x9131A000-0x9131AFFF	Intel(R) Serial IO I2C Host Controller - 5AB6
0x91319000-0x91319FFF	Intel(R) Serial IO I2C Host Controller - 5AB6
0x7C000001-0x7FFFFFFF	PCI Express Root Complex
0x7B800001-0x7BFFFFFF	PCI Express Root Complex
0x91321000-0x91321FFF	Intel(R) Trusted Execution Engine Interface

MEMORY MAP	ASSIGNMENT
0xD0C00000-0xD0C00653	Intel(R) Serial IO GPIO Host Controller - INT3452
0xCFFFF000-0xCFFFFFFF	Intel SD Host Controller
0xCFFFE000-0xCFFFEFFF	Intel SD Host Controller
0x91314000-0x91315FFF	Standard SATA AHCI Controller
0x9131E000-0x9131E0FF	Standard SATA AHCI Controller
0x9131D000-0x9131D7FF	Standard SATA AHCI Controller
0x91280000-0x912FFFFF	Intel(R) I210 Gigabit Network Connection #2
0x9127C000-0x9127FFFF	Intel(R) I210 Gigabit Network Connection #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 F81966 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 watchdog timer and set 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 timeout interval to 30 ---------------------------------------
dec     dx
mov     al,     0F6h
out     dx,     al
inc     dx
mov     al,     1Eh
out     dx,     al
;------------------Set second as counting unit and start counting ---------------------
dec     dx
mov     al,     0F5h
out     dx,     al
inc     dx
in      al,     dx
and     al,     30h
out     dx,     al
;---------------------------------Exit the extended function mode ----------------------
dec     dx
mov     al,     0AAh
out     dx,     al
```

Flash BIOS Update

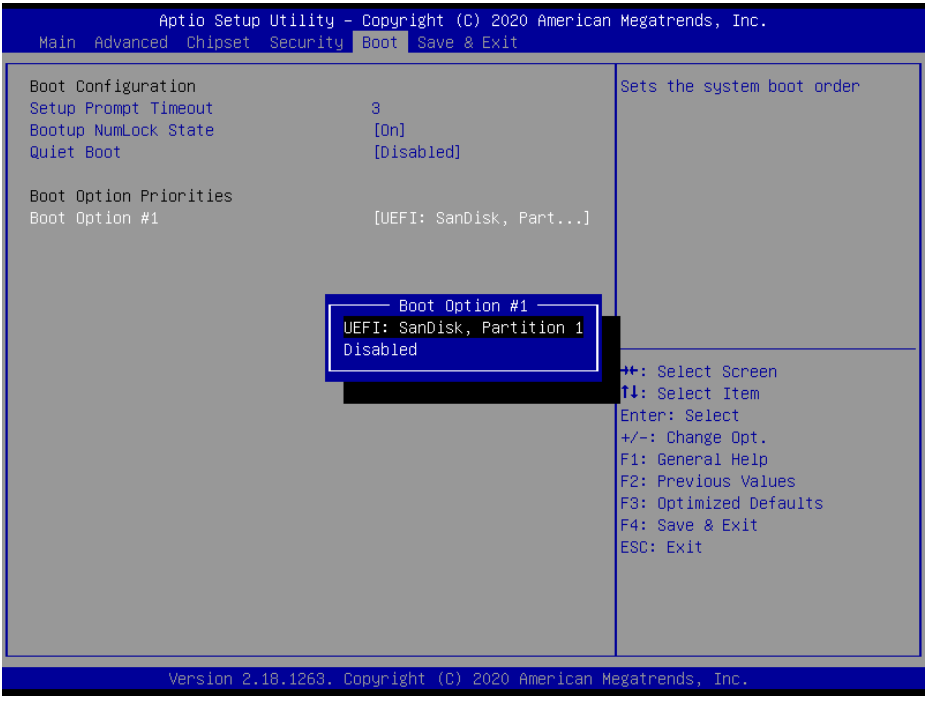
I. Prerequisites

1 Prepare a USB storage device which can save the required files for BIOS update.

2 Download and save the BIOS file (e.g. J6700PD0.bin) to the storage device.

3 Copy AMI flash utility – AFUEFIx64.exe (v5.12.03) into the storage device. The utility and BIOS file should be saved to the same path.

4 Make sure the target system can first boot to the EFI shell environment.
(1) Connect the USB storage device.
(2) Turn on the computer and press **<ESC>** or **<DEL>** key during boot to enter BIOS Setup.
(3) Select **[Boot]** menu and set **UEFI USB flash drive** to be the 1st boot device.
(4) Press **<F4>** key to save configuration and restart the system to boot into EFI Shell environment.



II. AFUDOS Command for System BIOS Update

AFUEFIx64.efi is the AMI firmware update utility; the command line is shown as below:

AFUEFIx64 <ROM File Name> [option1] [option2]….
User can type "AFUEFIx64 /?" to see all the definition of each control options. The recommended options for BIOS ROM update include 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 Boot into EFI Shell and change to the path where you put BIOS image and AFUEFIx64.

```
Shell> fs0:
fs0:\> cd afuefix64
```

2 Type "**AFUEFIx64 J67Xxxxx.bin /p /b /n /x"** and press Enter to start the flash procedure. (xxxx means the BIOS revision part, e.g. 0PM1…)

3 During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and make system unable to boot up next time.

4 After the BIOS update procedure is completed, the following messages will display:

```
fs0:\afuefix64> afuefix64 J6700PD0.bin /p /b /n /x

 +-------------------------------------------------------------------------+
 |                    AMI Firmware Update Utility  v5.12.03.2045           |
 |Copyright (C) 2019 American Megatrands Inc. All Rights Reserved.         |
 +-------------------------------------------------------------------------+
 Reading flash ..............  done
 - ME Data Size Checking . ok
 - FFS checksums ......... ok
 - Check RomLayout ......... 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

 fs0:\afuefix64> _
```

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.