USER'S MANUAL

PA-5822 Series

15" Fanless Slim POS Terminal with Intel® Celeron® J1900 Quad-Core

PA-5822 M2

PA-5822 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

Revision History viii

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 Normal Stand 1-4

1.2.3 Normal Stand with 15" 2nd display 1-5

1.2.4 Normal Stand with VFD 1-6

1.3 System Specifications 1-7

1.4 Safety Precautions 1-10

2 System Configuration 2-1

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

2.2 Function Buttons and I/O Ports 2-3

2.2.1 Power Button 2-3

2.2.2 DC-IN Port 2-3

2.2.3 VGA Port 2-3

2.2.4 COM Port 2-4

2.2.5 USB Port 2-4

2.2.6 LAN Port 2-5

2.2.7 Printer Power Port (Optional) 2-6

2.2.8 Cash Drawer Port 2-6

2.2.9 2nd Display Power Port 2-6

2.2.10 PS/2(I-BUT) Port (Optional) 2-6

2.3 Main Board Component Location & Jumper Settings 2-7

2.4 Jumper & Connector Quick Reference Table 2-9

2.5 Setting Jumpers 2-10

2.6 Setting Main Board Connectors and Jumpers 2-12

2.6.1 COM, Cash Drawer Port Voltage Selection 2-12

2.6.2 COM Connectors 2-13

2.6.3 i-Button Connector (1) 2-13

2.6.4 COM2 & i-Button Function Selection 2-13

2.6.5 USB Connector 2-14

2.6.6 LED Connector 2-14

2.6.7 Speaker Connector 2-14

2.6.8 Power Connector 2-15

2.6.9 Inverter Connector 2-15

2.6.10 Touch Panel Connector 2-15

2.6.11 Reserved Connectors 2-16

2.6.12 Panel Resolution Selection 2-17

2.6.13 Mini PCIE USB Selection 2-17

2.6.14 i-Button Connector(2) 2-18

2.6.15 LVDS Connector 2-19

2.6.16 Touch Panel Signal Interface Selection 2-20

2.6.17 SATA & SATA Power Connector 2-21

2.6.18 Update BIOS Settings 2-22

2.6.19 Clear CMOS Data Selection 2-22

2.6.20 LVDS Link (JP16) 2-23

2.6.21 LVDS Voltage Selection (JP17) 2-23

2.6.22 Panel Enable (JP20) 2-24

2.6.23 Mini-PCIe / mSATA Connector 2-24

2.7 VFD Board Component Locations & Pin Assignment 2-25

2.7.1 VFD Board: MB-4003 2-25
2.7.2 Jumper & Connector Quick Reference Table 2-25
2.7.3 Setting MB-4003 VFD Board Connectors and Jumpers 2-25
2.7.3.1 Power Switch Selection 2-25
2.7.3.2 RS-232 Serial Interface Connector 2-26

3 Software Utilities 3-1

3.1 DRIVER 3-2
3.1.1 Introduction 3-2
3.1.2 Intel® Chipset Software Installation Utility 3-6
3.1.2.1 Introduction 3-6
3.1.2.2 Installing Intel® Chipset Driver 3-6
3.1.3 Graphics Driver Utility 3-6
3.1.3.1 Installing Graphics Driver 3-6
3.1.4 LAN Driver Utility 3-7
3.1.4.1 Installing LAN Driver 3-7
3.1.5 Sound Driver Utility 3-7
3.1.5.1 Installing Sound Driver 3-7
3.1.6 Intel® Trusted Execution Engine Driver Installation 3-8
3.1.6.1 Installing TXE Driver 3-8
3.1.7 Embedded Peripheral Devices 3-9
3.1.7.1 VFD: MB-4003 (RS-232) Commands List 3-9
3.1.7.2 OPOS Driver 3-10

3.2 API 3-15
3.2.1 API Package Content 3-15
3.2.2 API Procedure 3-16
3.2.3 Cash Drawer 3-19
3.2.4 Watchdog 3-20

3.3 API Function 3-21
3.3.1 Cash Drawer Function 3-21
3.3.2 Watch Dog Function 3-22

3.4 BIOS Operation 3-23
3.4.1 BIOS Setup 3-23
3.4.1.1 Accessing Setup Utility 3-24
3.4.2 Main 3-26
3.4.2.1 Advanced 3-27
3.4.2.2 Chipset 3-47
3.4.2.3 Security 3-51
3.4.2.4 Boot 3-52
3.4.2.5 Save & Exit 3-54
3.4.3 Configuring WatchDog Timer 3-56
3.4.4 Update Procedure 3-58
3.4.5 Resource Map 3-61
3.4.5.1 Interrupt Map 3-61
3.4.5.2 I/O MAP 3-66
3.4.5.3 DMA Channels Map 3-68
3.4.5.4 Memory Map 3-69

Appendix A System Diagrams A-1

HDD Tray Disassembly A-2
MSR module Assembly A-3
i-Button module Assembly A-4
Fingerprint module Assembly A-5
Arrangement of the cable A-6
Front Cover Module Exploded Diagram (Capacitive Touch Screen) A-9
Panel Module Exploded Diagram (Capacitive Touch Screen) A-10
Motherboard Exploded Diagram (Capacitive Touch Screen) A-11

Back Cover Exploded Diagram (Capacitive Touch Screen)..... A-12
Exploded Diagrams For Panel PC HDD Assembly (Capacitive Touch Screen)..... A-13
AI Cover Exploded Diagram (Capacitive Touch Screen)..... A-14
I/O Cover Exploded Diagram (Capacitive Touch Screen) A-15
Front Cover Module Exploded Diagram (Resistive Touch Screen)..... A-16
Panel Module Exploded Diagram (Resistive Touch Screen) A-17
Motherboard Exploded Diagram (Resistive Touch Screen) A-18
Back Cover Exploded Diagram (Resistive Touch Screen) A-19
Exploded Diagrams For Panel PC HDD Assembly (Resistive Touch Screen) A-20
AI Cover Exploded Diagram (Resistive Touch Screen) A-21
I/O Cover Exploded Diagram (Resistive Touch Screen)..... A-22
I-Button Exploded Diagram..... A-23
RFID Module Exploded Diagram A-24
RJ11 Cable Exploded Diagram A-25
Barcode Scanner Kit Exploded Diagram A-26
Print Power Cable Exploded Diagram..... A-27
Fingerprint Module Exploded Diagram..... A-28
MSR Module Exploded Diagram..... A-29
Stand Exploded Diagram A-30

List of Figures

Figure 2-1. PB-6722 Main Board Component Location 2-7
Figure 2-2. MB-4003 VFD Board Component Locations 2-25
Figure 3-1. Extensible Firmware Interface Diagram 3-23
Figure 3-2. POST Screen with AMI Logo..... 3-24
Figure 3-3. BIOS Setup Menu Initialization Screen 3-25
Figure 3-4. BIOS Main Menu 3-26
Figure 3-5. BIOS Advanced Menu..... 3-27
Figure 3-6. ACPI Settings Screen 3-28
Figure 3-7. F81866 Super IO Configuration Screen 3-29
Figure 3-8. Serial Port 1 Configuration Screen..... 3-30
Figure 3-9. Serial Port 2 Configuration Screen..... 3-31
Figure 3-10. Serial Port 3 Configuration Screen..... 3-32
Figure 3-11. Serial Port 4 Configuration Screen 3-33
Figure 3-12. Parallel Port Configuration Screen..... 3-34
Figure 3-13. Hardware Monitor Screen 3-36
Figure 3-14. F81866 Watchdog Screen..... 3-37
Figure 3-15. CPU Configuration Screen..... 3-38
Figure 3-16. Socket 0 CPU Information Screen 3-39
Figure 3-17. IDE Configuration Screen 3-40
Figure 3-18. OS Selection Screen..... 3-42
Figure 3-19. CSM Configuration Screen 3-43
Figure 3-20. USB Configuration Screen..... 3-45
Figure 3-21. Chipset Menu Screen 3-47
Figure 3-22. North Bridge Menu Screen..... 3-48
Figure 3-23. LCD Control Screen..... 3-49
Figure 3-24. South Bridge Screen..... 3-50
Figure 3-25. Security Menu Screen..... 3-51

Figure 3-26. Boot Menu Screen 3-52
Figure 3-27. Hard Drive BBS Priorities Screen 3-53
Figure 3-28. Save & Exit Menu Screen 3-54

Revision History

The revision history of PA-5822 User Manual is described below:

Version No.	Revision History	Page No.	Date
M1	Initial Release	-	2017/09
M2	Add Arrangement of the cable. Add Easy Maintain for Stand.	A-6 A-31	2017/11

1 Introduction

This chapter gives you the information for the PA-5822. 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-5822 Series System. The PA-5822 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-5822 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains four chapters and two appendixes. Users can configure the system according to their own needs.

Chapter 1 Introduction

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

Chapter 2 System Configuration

This chapter outlines the location of motherboard, VFD components and their function. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 3 Software

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

Appendix A System Diagrams

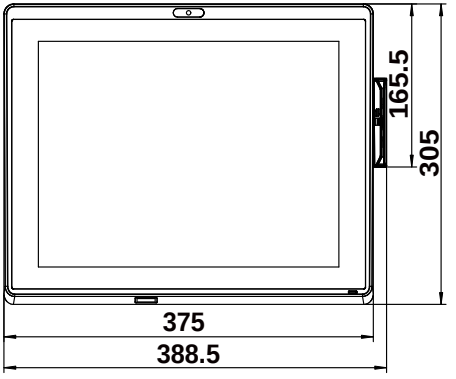
This chapter shows the exploded diagrams and part numbers of PA-5822 components.

1.2 POS System Diagrams

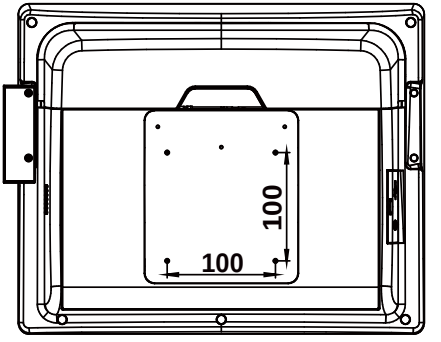
Unit: mm

1.2.1 Panel PC

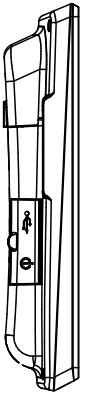
Front view



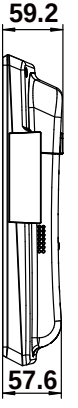
Rear view



Left view



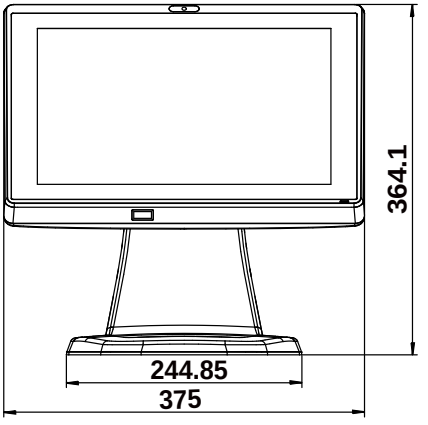
Right view



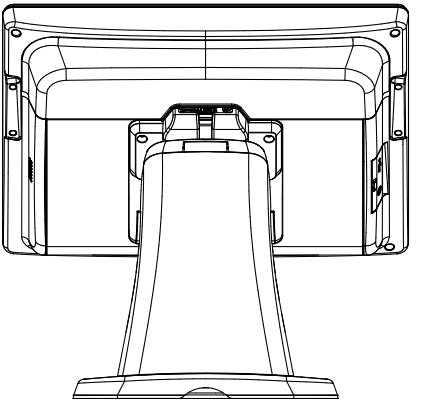
1.2.2 Normal Stand

Unit: mm

Front view



Rear view



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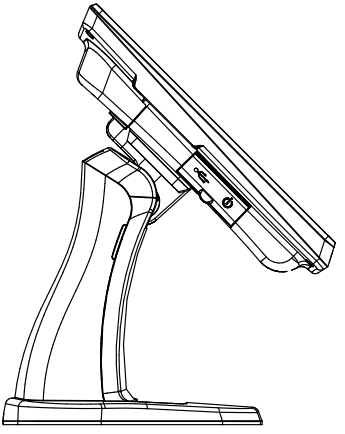
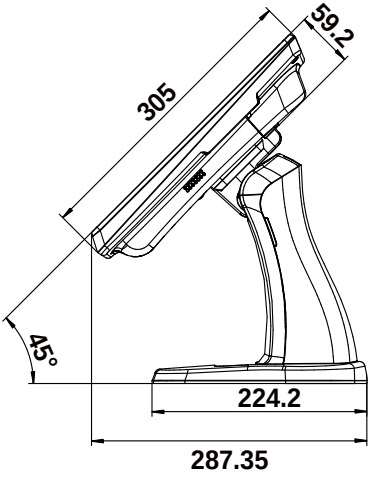


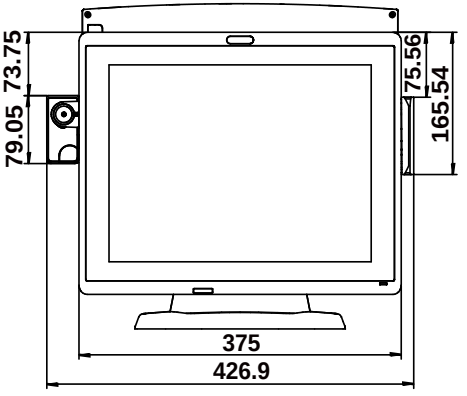
Right view



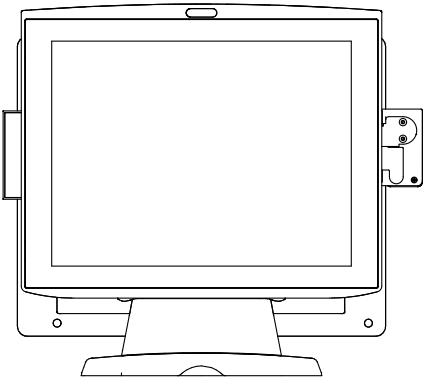
1.2.3 Normal Stand with 15" 2nd display

Unit: mm

Front view



Rear view



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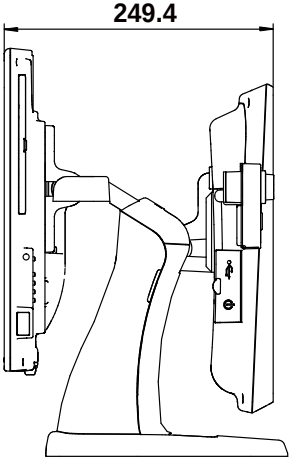
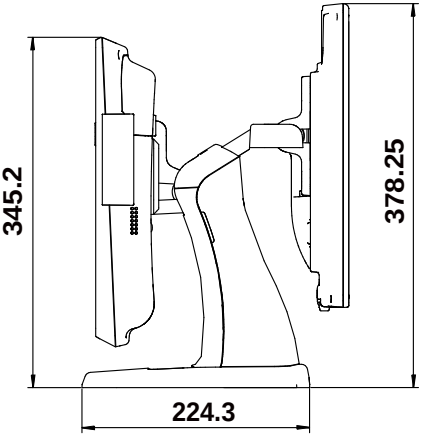


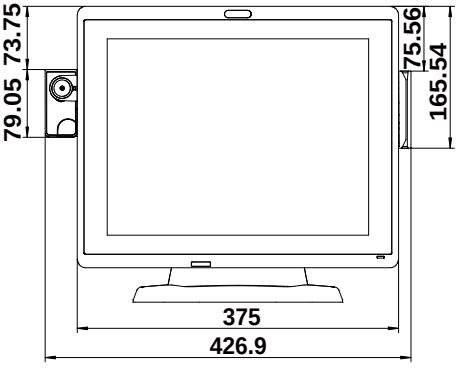
Right view



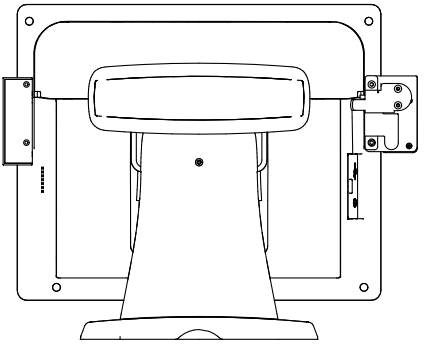
1.2.4 Normal Stand with VFD

Unit: mm

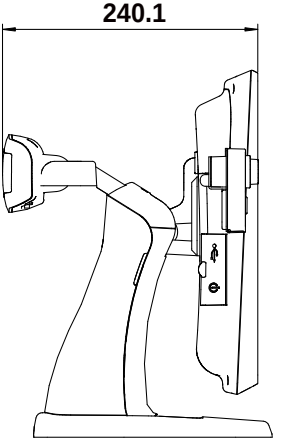
Front view



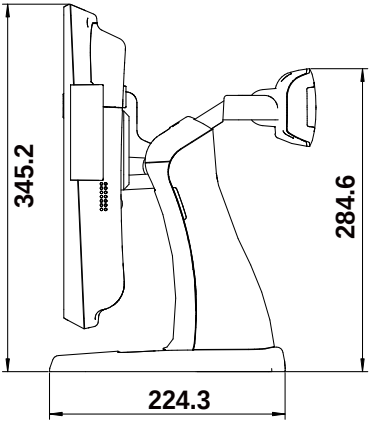
Rear view



Left view



Right view



1.3 System Specifications

System

CPU Support	Intel® Celeron® J1900 Quad-Core 2.0GHz
Memory	1 x DDR3L SO-DIMM 204-pin socket, up to 8GB
Network	1 x LAN (RJ45) 10/100/1000Mbps Base-T Fast Ethernet
OS Support	• Windows 7 Pro FES • Windows Embedded Standard 7 / WS7E • POSReady7 • Linux • Windows 8.1 • Windows 10 (2016)
Audio	1x 2W internal speaker
BIOS	AMI SPI BIOS
Hardware Monitor	(1) Voltage detection (5V, 12V, Battery) (2) CPU & system temperature detection
Watch Dog Timer	1~255 Sec
RTC Accuracy	3 days ± 3 seconds
System Weight	**POS:** 6.4kg **PPC:** 3.8kg
Wall Mount	VESA Mount 100x100 mm
Dimension (W x H x D)	**POS:** 375 x 290 x 360mm (45 degrees) **PPC:** 375 x 305 x 59.2mm

Storage

SATA	Supports 1 x 2.5”HDD or SSD

I/O Ports

USB	On rear: • 3 x USB 2.0 • 1 x USB 3.0 On side bezel: • 1 x USB 2.0
Serial Ports	3 x COM(RJ45) w/ +5V/12V selectable
LAN	1 x RJ45
VGA	1 x DB15

Cash Drawer	RJ-11 6pin, GPIO w/ +12V/24V selectable (Support Dual GPIO for drawer kick-out)
DC Input	1 x4pin DC-In DIN 4Pin (DC24V)
Optional ports	• Option 1: 1 x COM (RJ45) w/ +5V/12V selectable • Option 2: 1 x PS/2 (RJ11) • Option 3: 1 x Print power (3pin, DC24V)
Internal Expansion Slot	1 x mini-PCIe slot for optional accessories

Display

15" TFT XGA LCD	Max. Resolution: 1024 x 768 300 cd/m^2
Touchscreen	Bezel-free touchscreen: • Option 1: 15" Resistive Touch Panel • Option 2: 15" Projected Capacitive Touch Panel

Environment

Temperature	• Operating: 0°C ~35°C (32°F ~ 95°F) • Storage: -5°C ~60°C (-27°F ~ 140°F)
Humidity	20%~90%
Waterproof	IP54 (Front panel only)

Power Adapter

Power Adapter	• 60W DC 24V Power Adapter • connector type for output: DIN 4Pin • Supports 90 ~240 Vac, 50/60Hz

Optional Accessories

WiFi module	Wireless LAN module **Interface:** mini PCIe
RFID module	Vertical hang-up,Read /Write, 13.56MHz, ISO, 14443A, Mifare® Class / UltraLight, Mifare® PRO, DESfire, DESfire EV1 (MF320R-FH) **Interface:** RS232

2nd display / VFD	Option 1: 8" display 800 x 600; Option 2: 10.4" display 800 x 600 Option 3: 15" display 1024X768 (MP-4815) **Interface:** VGA Option 4: VFD module (MB-4003RB-11N) Baud Rate: 9600/19200 bps Placement: 20 columns and 2 lines, each column is 5 x 7 dots • Standard Code: CP-437, Katakana, CP-737, CP-850, CP-852, CP-857, CP-860, CP-862, CP-863,CP-865, CP-866, CP-1250, CP-1251, CP-1252, CP-1253, CP-1254, CP-1255, CP-1257 • International Characters: USA, FRANCE, GERMANY, UK, DENMARKI, SWDEN, ITALY, SPAIN I, JAPAN, NORWAY, DENMARK II, SPAIN II, LATIN, KOREA, RUSSIA, SLAVONIC **Interface:** RS-232C (RJ45)
MSR	Support: JIS-I or II, ISO Track1+2+3 **Interface:** USB
i-Button	Option1: IBT300A-0-0 Option2: IBT300X-C-0 **Interface:** USB or RS-232 or PS/2 keyboard wedge
Fingerprint	8-bit grayscale reader **Interface:** USB

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-5822 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   - Avoid installing your PA-5822 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-5822 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-5822 from strong vibrations which may cause hard disk failure.
   - Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
   - Always shut down the operation system before turning off the power.

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

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

2 System Configuration

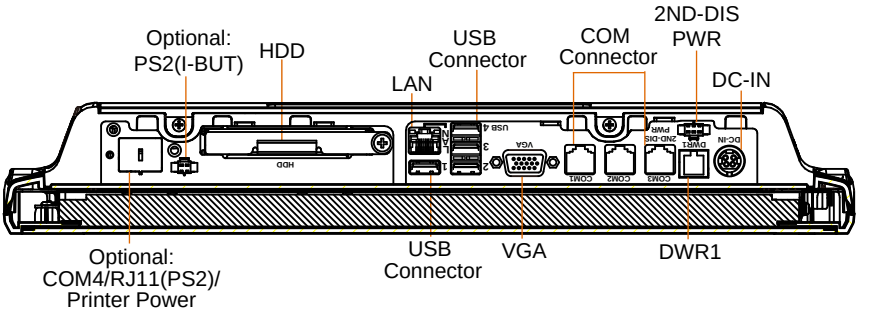
This chapter contains helpful information that describes the jumper and connector settings, component locations, and pin assignment.

The following topics are included:

- System External I/O Ports Diagram
- Function Buttons and I/O Ports
- Main Board Component Locations & Jumper Settings
- Jumper & Connector Quick Reference Table
- Setting Jumpers
- Setting Main Board Connectors and Jumpers
- VFD Board Component Locations & Pin Assignment

2.1 System External I/O Ports Diagram & Pin Assignment

Rear I/O Ports



2.2 Function Buttons and I/O Ports

2.2.1 Power Button

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

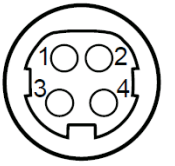
ACTION	ASSIGNMENT
Click	0V
Release	+3.3V

Power Button

2.2.2 DC-IN Port

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

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

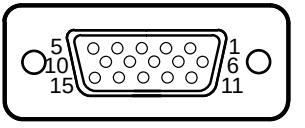


DC-IN

2.2.3 VGA Port

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

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

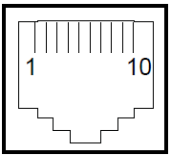


VGA

2.2.4 COM Port

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

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



COM1/
COM2/
COM3/
COM4 (option)

Note: COM3 & COM3_1 will not function when jumpers JP10, JP11, JP12 are set as 2-3 connected (i-Button). Refer to the **i-Button Function Selection** section for details. COM4_2 will not function when COM4_1 is selected as the printer control interface.

2.2.5 USB Port

USB1, USB2, USB3, USB4, USB5: USB Type A Ports

- USB1-4: Rear IO
- USB5: Side IO

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

USB1/
USB2/
USB3/
USB4/
USB5

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

2.2.6 LAN Port

LAN: LAN RJ-45 Port (rear IO)

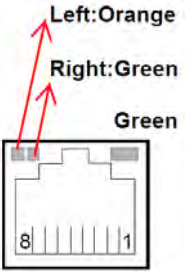
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MDIP0	5	MDIP2
2	MDIN0	6	MDIN2
3	MDIP1	7	MDIP3
4	MDIN1	8	MDIN3

LAN LED Status

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

RB Ver.

LAN LED Indicator	Color	Status	Description
Left Side LED	Orange	Blink	Giga LAN connection is activated.
	Green	Blink	10/100Mbps LAN connection is activated.
Right Side LED	Green	On	LAN switch/hub connected.

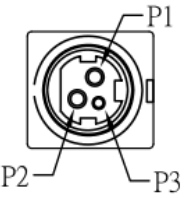


LAN

2.2.7 Printer Power Port (Optional)

PRINT PWR: DC24V power supply for the stand-printer

PIN	ASSIGNMENT
P1	GND
P2	+24V
P3	NA

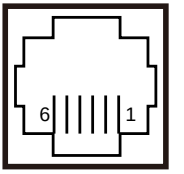


PRINT POWER

2.2.8 Cash Drawer Port

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

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

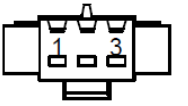


DRW1

2.2.9 2nd Display Power Port

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

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

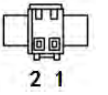


2nd DIS PWR

2.2.10 PS/2(I-BUT) Port (Optional)

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

PIN	ASSIGNMENT
1	COM3_DTR_R_I
2	COM3_RXD_R_I



PS/2 (I-BUT)

2.3 Main Board Component Location & Jumper Settings

M/B: PB-6722

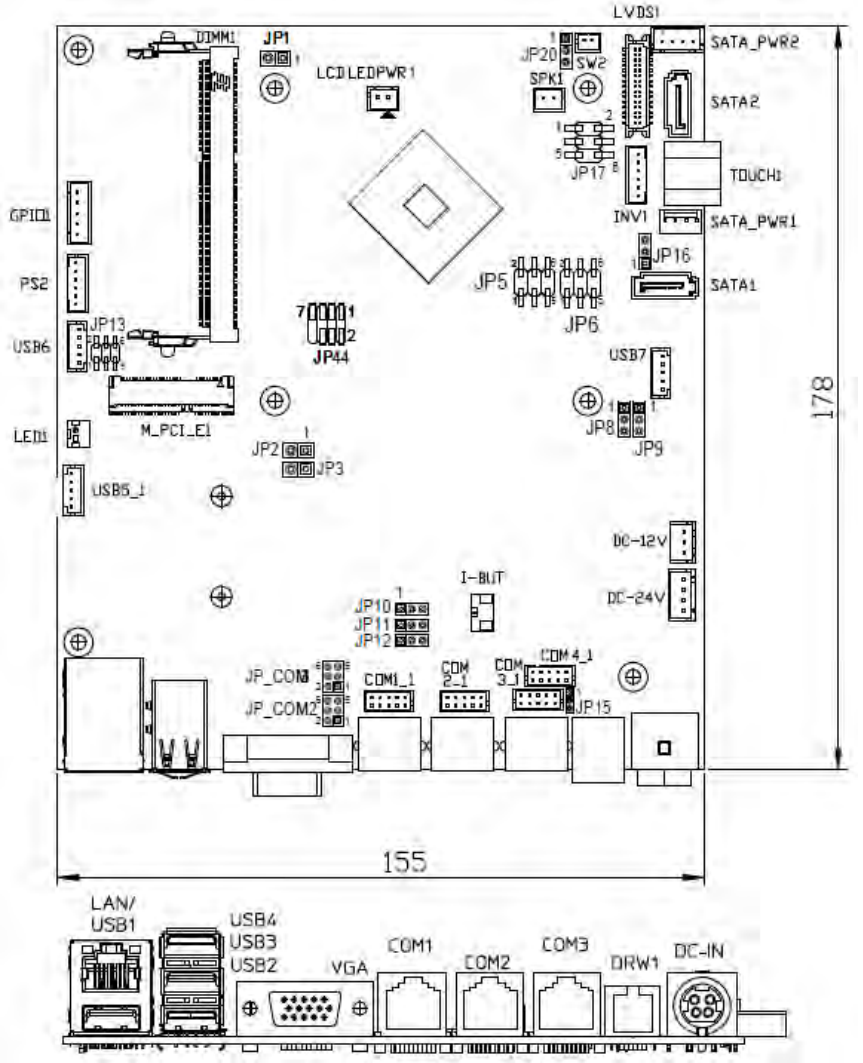


Figure 2-1. PB-6722 Main Board Component Location

	**WARNING:** Always disconnect the power cord when you are working with the connectors and jumpers on the main board. Make sure both the system and the external devices are turned OFF as sudden surge of power could ruin sensitive components. Make sure PA-5822 is properly grounded.
	**CAUTION:** Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while configuring the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.

2.4 Jumper & Connector Quick Reference Table

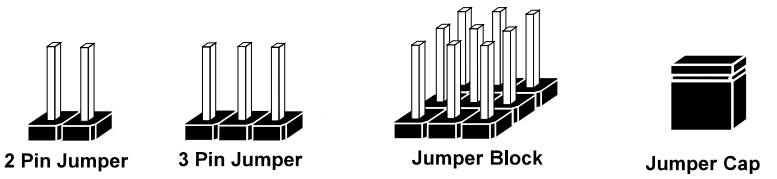
Jumper / Connector	NAME
COM, Cash Drawer Port Voltage Selection	COM2, COM3, JP_COM2, JP_COM3 COM1, COM4, DRW1
COM Connectors	COM1_1, COM2_1, COM3_1, COM4_1
i-Button Connector (1)	I-BUT
COM2, i-Button Function Selection	JP10, JP11, JP12
Cash Drawer Control Selection	JP15, DRW1 (DRW1-1, DRW1-2), DRW2
USB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

2.5 Setting Jumpers

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

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

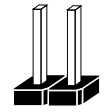
Jumpers & Caps



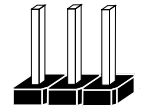
If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different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

Jumper Diagrams

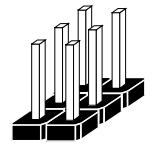
Jumper Cap looks like this



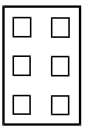
2 pin Jumper looks like this



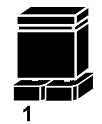
3 pin Jumper looks like this



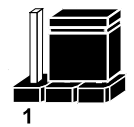
Jumper Block looks like this



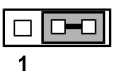
Jumper Settings

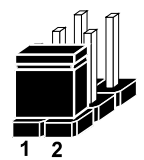


2 pin Jumper closed(enabled)
looks like this

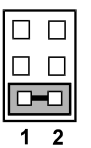


3 pin Jumper
2-3 pin closed(enabled)
looks like this





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

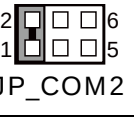
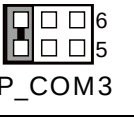
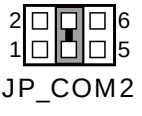
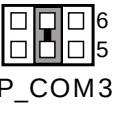
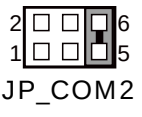
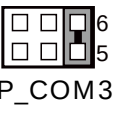


2.6 Setting Main Board Connectors and Jumpers

2.6.1 COM, Cash Drawer Port Voltage Selection

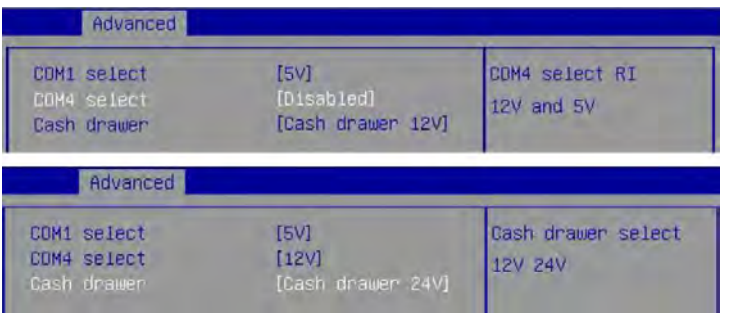
COM2 / COM3: The voltages of both COM2 & COM3 ports can be adjusted by setting relevant jumpers on board.

JP_COM2, JP_COM3: Pin headers on board

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

COM1 / COM4 /DRW1

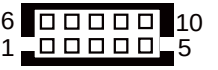
The voltages of the external ports "COM1 & COM4 & Cash Drawer" can be adjusted via BIOS for your convenience.



2.6.2 COM Connectors

COM1_1, COM2_1, COM3_1, COM4_1: COM Connectors

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

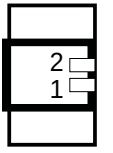


COM1_1/
COM2_1/
COM3_1/
COM4_1

2.6.3 i-Button Connector (1)

I-BUT: i-Button Connector

PIN	ASSIGNMENT
1	COM3_DTR_R_I
2	COM3_RXD_R_I



I-BUT

2.6.4 COM2 & i-Button Function Selection

JP10, JP11, JP12: i-Button Function Connectors

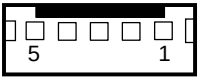
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM2 (Default)	1-2	 JP10/JP11/JP12/
I-BUT*	2-3	 JP10/JP11/JP12/

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

2.6.5 USB Connector

USB5_1, USB6, USB7: USB 2.0 connector

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



USB5_1/
USB6/
USB7

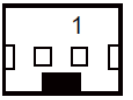
Notes:

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

2.6.6 LED Connector

LED1: Power indication LED connector

PIN	ASSIGNMENT
1	GND
2	PWR_LED

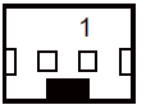


LED1

2.6.7 Speaker Connector

SPK1: Speaker Connector

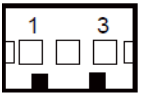
PIN	ASSIGNMENT
1	HD_FRONT-OUT-R
2	HD_FRONT-OUT-L



SPK1

2.6.8 Power Connector

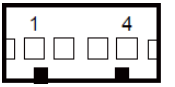
DC12V: DC 12 Voltage Provider Connector



DC12V

PIN	ASSIGNMENT
1	VCC12
2	GND
3	VCC12

DC24V: Power for Thermal Printer Connector

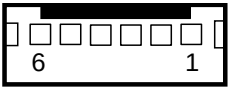


DC24V

PIN	ASSIGNMENT
1	VCC24
2	VCC24
3	GND
4	GND

2.6.9 Inverter Connector

INV1: Inverter connector



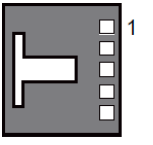
INV1

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

2.6.10 Touch Panel Connector

TOUCH1: Touch panel connector

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

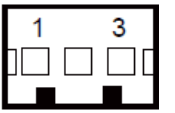


TOUCH1

2.6.11 Reserved Connectors

SPK2: External audio phone jack reserved connector

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



SPK2

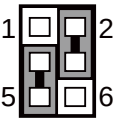
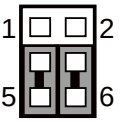
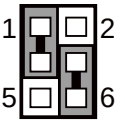
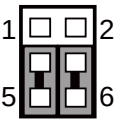
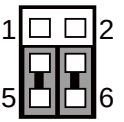
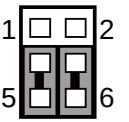
GPIO1: 2 ports GPIO & DC5V & DC3.3V reserved connector

PIN	ASSIGNMENT
1	GPIO1
2	GPIO2
3	5V (Maximum current: 0.5A)
4	3.3V ((Maximum current: 0.5A)
5	GND

GPIO1

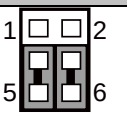
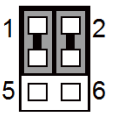
2.6.12 Panel Resolution Selection

JP5, JP6: Panel resolution control connectors

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

2.6.13 Mini PCIE USB Selection

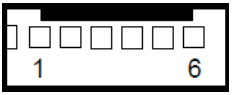
JP13: "USB6 signal support to" selection

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

2.6.14 i-Button Connector(2)

PS/2_1: i-Button connector

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

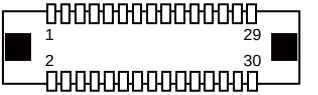


PS/2_1

2.6.15 LVDS Connector

LVDS1: LVDS Connector

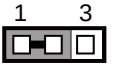
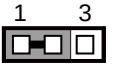
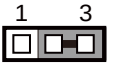
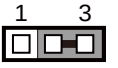
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LVDS_VCC	16	LVDS_CLKA_D+
2	PANEL_Reverse	17	VDS_CLKA_D-
3	LVDS_CLKB_D-	18	GND
4	LVDS_CLKB_D+	19	LVDS_A2_D+
5	GND	20	LVDS_A2_D-
6	LVDS_B2_D-	21	GND
7	LVDS_B2_D+	22	LVDS_A1_D+
8	GND	23	LVDS_A1_D-
9	LVDS_B1_D-	24	GND
10	LVDS_B1_D+	25	LVDS_A0_D+
11	LVDS_B3_D+	26	LVDS_A0_D-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



LVDS1

2.6.16 Touch Panel Signal Interface Selection

JP8, JP9: Control connectors for touch panel signal interface

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

2.6.17 SATA & SATA Power Connector

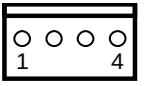
SATA1, SATA2: Serial ATA connectors

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

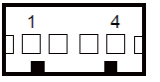
SATA1/
SATA2

SATA_PWR1, SATA_PWR2: Serial ATA power connectors

PIN	ASSIGNMENT
1	VCC
2	GND
3	GND
4	VCC12

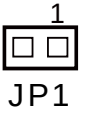
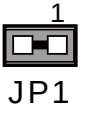


SATA_PWR1/
SATA_PWR2



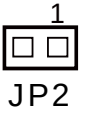
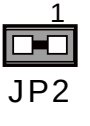
2.6.18 Update BIOS Settings

JP1: Update BIOS settings

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

2.6.19 Clear CMOS Data Selection

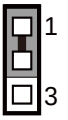
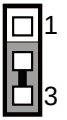
JP2: Clear CMOS data selection

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

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

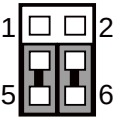
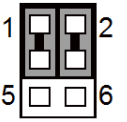
2.6.20 LVDS Link (JP16)

JP16: LVDS Link

Selection	Jumper Setting	Jumper Illustration
5V	1-2	 JP16
0V	2-3	 JP16

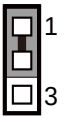
2.6.21 LVDS Voltage Selection (JP17)

JP17: LVDS Voltage Selection

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

2.6.22 Panel Enable (JP20)

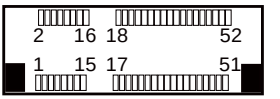
JP20: Panel Enable

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

2.6.23 Mini-PCIe / mSATA Connector

SLOT1: Mini-PCIe connector, USB function not supported

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



SLOT1

2.7 VFD Board Component Locations & Pin Assignment

2.7.1 VFD Board: MB-4003

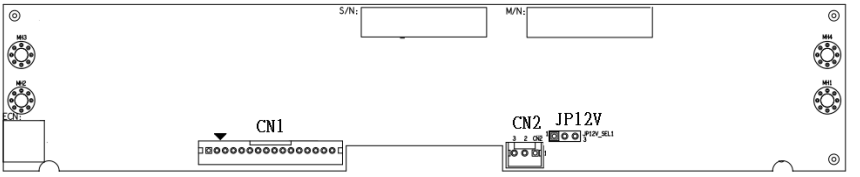


Figure 2-2. MB-4003 VFD Board Component Locations

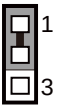
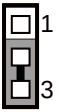
2.7.2 Jumper & Connector Quick Reference Table

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

2.7.3 Setting MB-4003 VFD Board Connectors and Jumpers

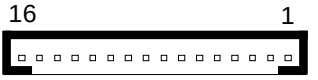
2.7.3.1 Power Switch Selection

JP12V: Power Switch Selection

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

2.7.3.2 RS-232 Serial Interface Connector

CN1: RS-232 serial interface wafer



CN1

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

3 Software Utilities

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

- Driver
  - Intel® Chipset Software Installation Utility
  - Graphics Driver Utility
  - LAN Driver Utility
  - Sound Driver Utility
  - Intel ® Trusted Execution Engine Driver Installation
- Embedded Peripheral Devices
  - VFD: MB-4003 (RS-232)
  - OPOS
- API
- BIOS Operation
  - BIOS Setup
  - Watchdog Timer Configuration
  - Update Procedure
  - System Resource Map

3.1 DRIVER

3.1.1 Introduction

Enclosed with the PA-5822 Series package is our driver utilities, which comes in a DVD-ROM format.

Filename (Assume that DVD-ROM drive is D:)	Purpose	OS	
		DOS	Windows 7 (32/64bit)
D:\Driver\Flash BIOS	For Aptio(EFI) BIOS update utility	V	X
D:\Driver\Platform\Win7(32-64bit)\ Main Chip	Intel(R) Chipset Device Software Installation Utility	X	V
D:\Driver\Platform\Win7(32-64bit)\ Graphics	Intel Celeron J1900 For VGA Driver installation	X	V
D:\Driver\Platform\Win7(32-64bit)\ TXE	For Intel Trusted Execution Engine Interface	X	V
D:\Driver\Platform\Win7(32-64bit)\ LAN Chip	Realtek RTL8119-CG For LAN Driver installation	X	V
D:\Driver\Platform\Win7(32-64bit)\ Sound Codec	Realtek ALC888 For Sound driver installation	X	V
D:\Driver\Platform\Win7(32-64bit)\ USB3.0	Intel(R) USB 3.0 eXtensible Host Controller	X	V
D:\Driver\Platform\Win7(32-64bit)\ Windows7 KMDF	Windows 7 update KMDF	X	V

Filename (Assume that DVD-ROM drive is D:)	Purpose	OS	
		DOS	POS Ready 7 (32/64bit)
D:\Driver\Flash BIOS	For Aptio(EFI) BIOS update utility	V	X
D:\Driver\Platform\POSReady7 (32-64bit)\Main Chip	Intel(R) Chipset Device Software Installation Utility	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\Graphics	Intel Celeron J1900 For VGA Driver installation	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\TXE	For Intel Trusted Execution Engine Interface	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\LAN Chip	Realtek RTL8119-CG For LAN Driver installation	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\Sound Codec	Realtek ALC888 For Sound driver installation	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\USB3.0	Intel(R) USB 3.0 eXtensible Host Controller	X	V
D:\Driver\Platform\POSReady7 (32-64bit)\Windows7 KMDF	Windows 7 update KMDF	X	V

Filename (Assume that DVD-ROM drive is D:)	Purpose	OS	
		DOS	Windows 8.1 (32/64bit)
D:\Driver\Flash BIOS	For Aptio(EFI) BIOS update utility	V	X
D:\Driver\Platform\Win8.1 (32-64bit)\Main Chip	Intel(R) Chipset Device Software Installation Utility	X	V
D:\Driver\Platform\Win8.1 (32-64bit)\Graphics	Intel Celeron J1900 For VGA Driver installation	X	V
D:\Driver\Platform\Wn8.1 (32-64bit)\TXE	For Intel Trusted Execution Engine Interface	X	V
D:\Driver\Platform\Win8.1 (32-64bit)\LAN Chip	Realtek RTL8119-CG For LAN Driver installation	X	V
D:\Driver\Platform\Win8.1 (32-64bit)\Sound Codec	Realtek ALC888 For Sound driver installation	X	V

Filename (Assume that DVD-ROM drive is D:)	Purpose	OS	
		DOS	Windows 10 (32/64bit)
D:\Driver\Flash BIOS	For Aptio(EFI) BIOS update utility	V	X
D:\Driver\Platform\Win10(32-64bit)\Main Chip	Intel(R) Chipset Device Software Installation Utility	X	V
D:\Driver\Platform\Win10(32-64bit)\Graphics	Intel Celeron J1900 For VGA Driver installation	X	V
D:\Driver\Platform\Win10(32-64bit)\TXE	For Intel Trusted Execution Engine Interface	X	V
D:\Driver\Platform\Win10(32-64bit)\LAN Chip	Realtek RTL8119-CG For LAN Driver installation	X	V
D:\Driver\Platform\Win10(32-64bit)\Sound Codec	Realtek ALC888 For Sound driver installation	X	V

3.1.2 Intel® Chipset Software Installation Utility

3.1.2.1 Introduction

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

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

3.1.2.2 Installing Intel® Chipset Driver

The utility pack is to be installed for Windows 7 / Windows 8.1 / Windows 10 / POSReady 7, and it should be installed right after the OS installation is completed. Please follow the steps below:

1. Connect the USB CD-ROM device to PA-5822 and insert the driver disk.
2. Open the "Main Chip" folder where the Chipset driver is located
3. Click ***Setup.exe*** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-5822 for the changes to take effect.

3.1.3 Graphics Driver Utility

The Graphics interface embedded with PA-5822 can support a wide range of display types. You can have dual displays by configuring CRT & LVDS interfaces to work simultaneously.

3.1.3.1 Installing Graphics Driver

To install the VGA driver, follow the steps below:

1. Connect the USB-DVD ROM device to PA-5822 and insert the driver disk.
2. Open the "Graphics" folder where the VGA driver is located. (depending on your OS platform)
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-5822 for the changes to take effect.

3.1.4 LAN Driver Utility

PA-5822 is enhanced with LAN function that can support various network adapters. Installation platform for the LAN driver is listed as follows:

3.1.4.1 Installing LAN Driver

To install the LAN Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-5822 and insert the driver disk.
2. Open the "LAN Chip" folder where the LAN driver is located. (depending on your OS platform)
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-5822 for the changes to take effect.

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

3.1.5 Sound Driver Utility

The sound function enhanced in this system is fully compatible with Windows 7 / Windows 8.1 / Windows 10 / POSReady 7. Below, you will find the content of the Sound driver.

3.1.5.1 Installing Sound Driver

To install the Sound Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-5822 and insert the driver disk.
2. Open the "Sound Codes" folder where the sound driver is located. (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-5822 for the changes to take effect.

3.1.6 Intel® Trusted Execution Engine Driver Installation

The Intel® ME software components that need to be installed depend on the system's specific hardware and firmware features. The installer, compatible with Windows 7 / Windows 8.1 / Windows 10 / POSReady 7, detects the system's capabilities and installs the relevant drivers and applications.

3.1.6.1 Installing TXE Driver

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the driver is located.
3. Run the application with administrative privileges.

3.1.7 Embedded Peripheral Devices

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

3.1.7.1 VFD: MB-4003 (RS-232) Commands List

1. VFD Registry Operation

Registry Path:
[HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\LineDisplay\Prox-PMP4000]

Registry Name	Default Data	Notes
Default Value	LineDisplay.PMP4000.1	-
BaudRate	9600	-
BitLength	8	-
Parity	0	-
Port	COM3	-
Stop	1	-

2. OPOS VFD Service Object and Method Relations

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

3.1.7.2 OPOS Driver

The **MB4000_OposSetup.exe** program sets up the registry information and example program of VFD for OPOS program uses.

1. Installation

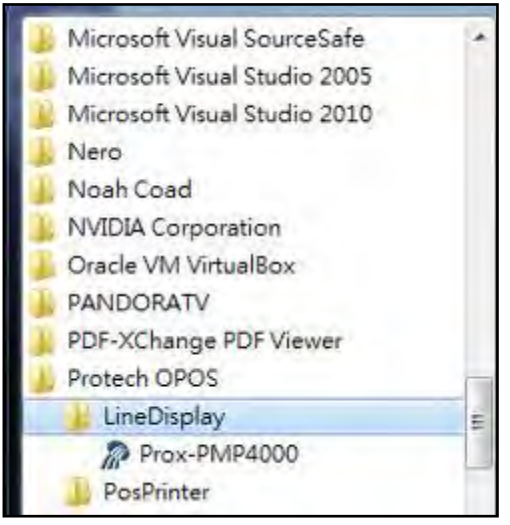
The steps below guide you to install the **MB4000_OposSetup** program.

- Run the **MB4000_OposSetup** setup file
- This setup also installs the **Prox-PMP4000** program.
- Follow the wizard instructions to complete the installation.

2. Launching the Program

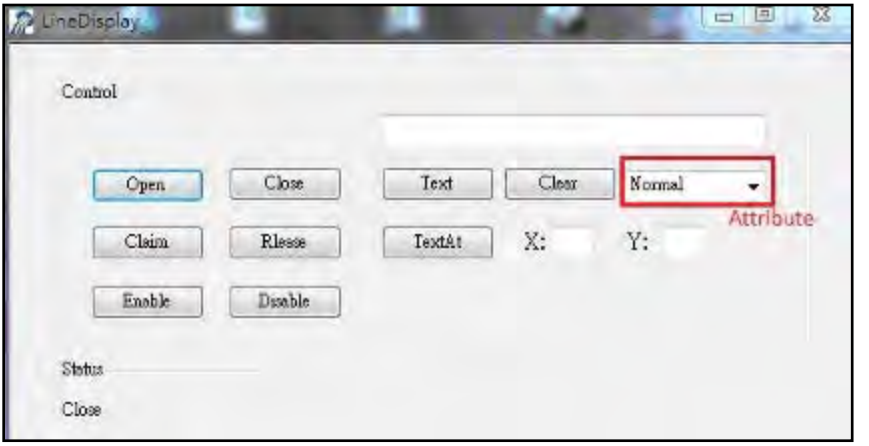
The steps below guide you to load the **Prox-PMP4000** program.

- Click the *LineDisplay* folder from the path: *Start/Programs/Protech OPOS*.
- Click **Prox-PMP4000** to launch the program.



3. OPOS Control Object of **Prox-PMP4000** program

Main screen buttons:



Button/Item	Description
Text	Display the text at the current cursor position.
TextAt	Display the string of characters at the point of the specified “y-coordinate” and “x-coordinate”.
Clear	Clear the message shown in the current window.
Attribute	• **Normal:** Display the normal characters on the display screen. • **Blink:** Enable the display screen to blink. • **Reverse:** Enable the character printing in reverse black and white. • **Blink+Reverse:** Enable the display screen to blink and activate the character printing in reverse black and white.

4. MB-4003 type

Key Name	Type	Default Value	Note
BaudRate	String	9600	UART Baud Rate (default)
BitLength	String	8	UART Data Bit (default)

Key Name	Type	Default Value	Note
Parity	String	0	UART Parity Bit (default)
Port	String	COM3	UART Port (default)
Stop	String	1	UART Stop Bit (default)

5. OPOS APIs Support List

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

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

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

3.2 API

3.2.1 API Package Content

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

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

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

3.2.2 API Procedure

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

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

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

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

Step 2. Create a button to call API Function.

a.) Call Cash drawer open event:

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

b.) Detect Cash drawer status:
A timer event can be created.

```
Private Sub Timer1_Tick (ByVal Sender As System.Object,ByVal e As System.EventArgs) Handles Timer1.Tick
    Dim Receive_Status1 as Boolean
    Dim Receive_Status2 as Boolean
    Receive_Status1 = CashDrawerOpen(&H1)
    If Receive_Status1 = true then
       Text1.text = "cash drawer1 open"    'enter text into textbox.
Else
Text1.text = "cash drawer1 close"    'enter text into textbox.
End if
'=========================================
    Receive_Status2 = CashDrawerOpen(&H2)
    If Receive_Status2 = true then
       Text2.text = "cash drawer2 open"    'enter text into textbox.
Else
Text2.text = "cash drawer2 close"    'enter text into textbox.
End if
'=========================================
End sub
```

Sample Code

(1) VB Declaration Method

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

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

(2) Call Function

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

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

(1) C# Declaration Method

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

(2) Call Function

Open cash drawer1

```
PortAccess.CashDrawerOpen(0x01);          //check cash drawer1 status
```

Open cash drawer2

```
PortAccess.CashDrawerOpen(0x02);          //check cash drawer2 status
```

```
Bool bstatus;
bstatus = PortAccess.GetCashDrawerStatus(0x01);
bstatus = PortAccess.GetCashDrawerStatus(0x02); //Before get cash drawer status, need to initial cash drawer first
```

VB.NET external function:

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

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

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

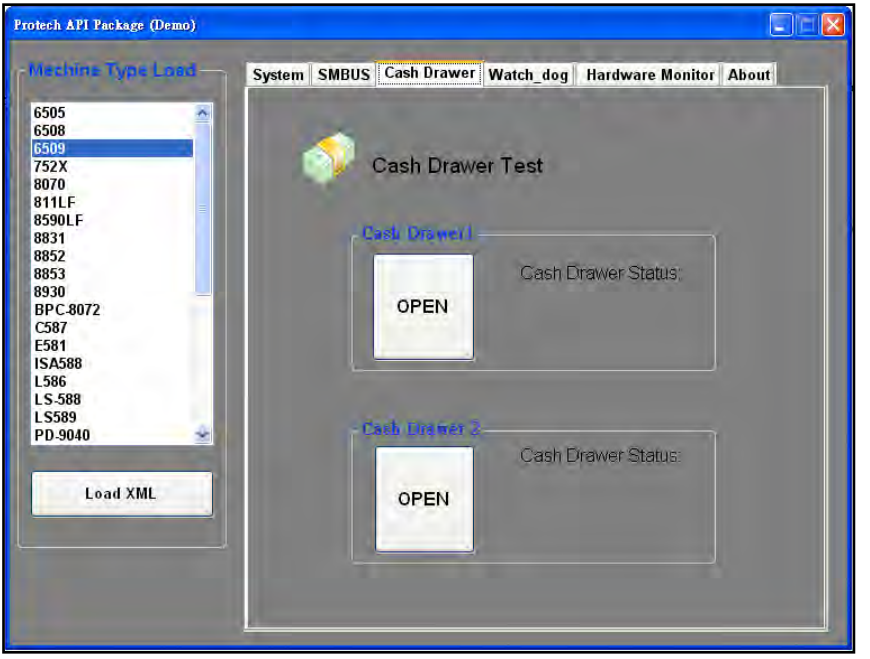
Declare Function GetCashDrawerStatus Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean
Declare Function CashDrawerOpen Lib CashDrawer.dll (ByVal num_drawer as short) As Boolean

VB 6 external function:

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

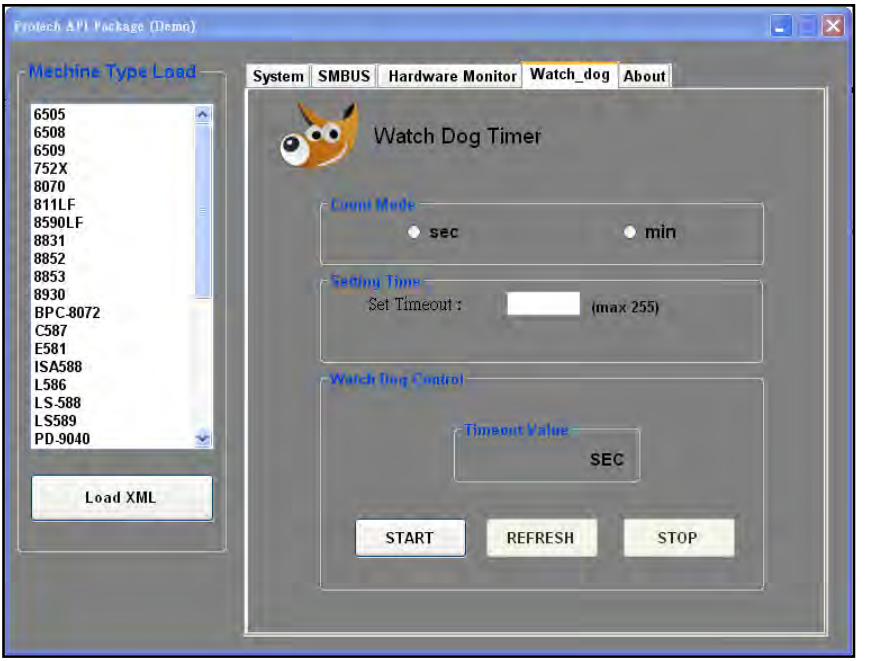
Note: VB.net short = integer VB6

3.2.3 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**

3.2.4 Watchdog



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

3.3 API Function

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

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

3.3.1 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
```

3.3.2 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

3.4 BIOS Operation

3.4.1 BIOS Setup

The board **PB-6722** uses an AMI Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the BIOS Setup program, Power-on Self-Test (POST), the PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

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

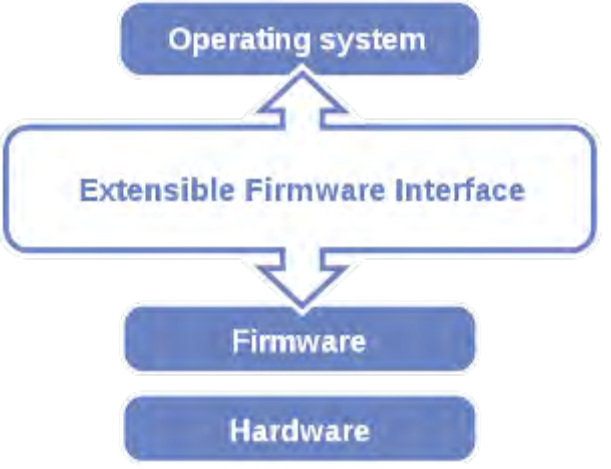


Figure 3-1. Extensible Firmware Interface Diagram

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

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

3.4.1.1 Accessing Setup Utility

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

Figure 3-2. POST Screen with AMI Logo

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

Figure 3-3. BIOS Setup Menu Initialization Screen

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

3.4.2 Main

Menu Path *Main*

Figure 3-4. BIOS Main Menu

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of the current BIOS version.
Sec RC Version	No changeable options	Displays the current Sec RC version.
TXE FW Version	No changeable options	Displays the current TXE Version
System Language	English	BIOS Setup language.
System Date	month, day, year	Set the current date. The “Day” is automatically changed.
System Time	hour, minute, second	Set the clock of the system.

3.4.2.1 Advanced

Menu Path *Advanced*

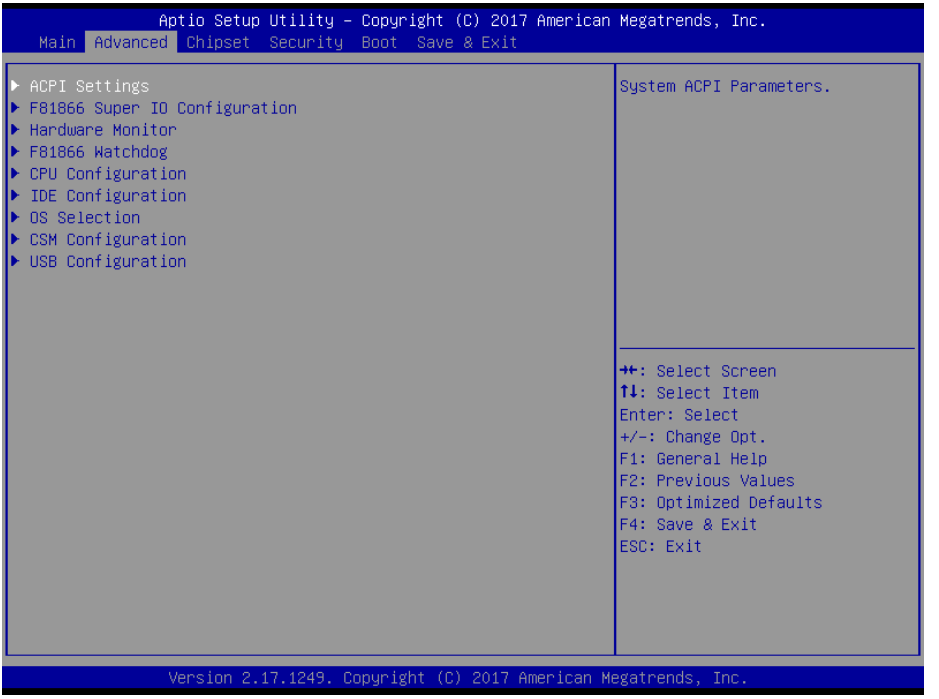


Figure 3-5. BIOS Advanced Menu

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

Advanced - ACPI Settings

Menu Path *Advanced > ACPI Settings*

Figure 3-6. ACPI Settings Screen

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

Advanced - F81866 Super IO Configuration

Menu Path *Advanced > F81866 Super IO Configuration*

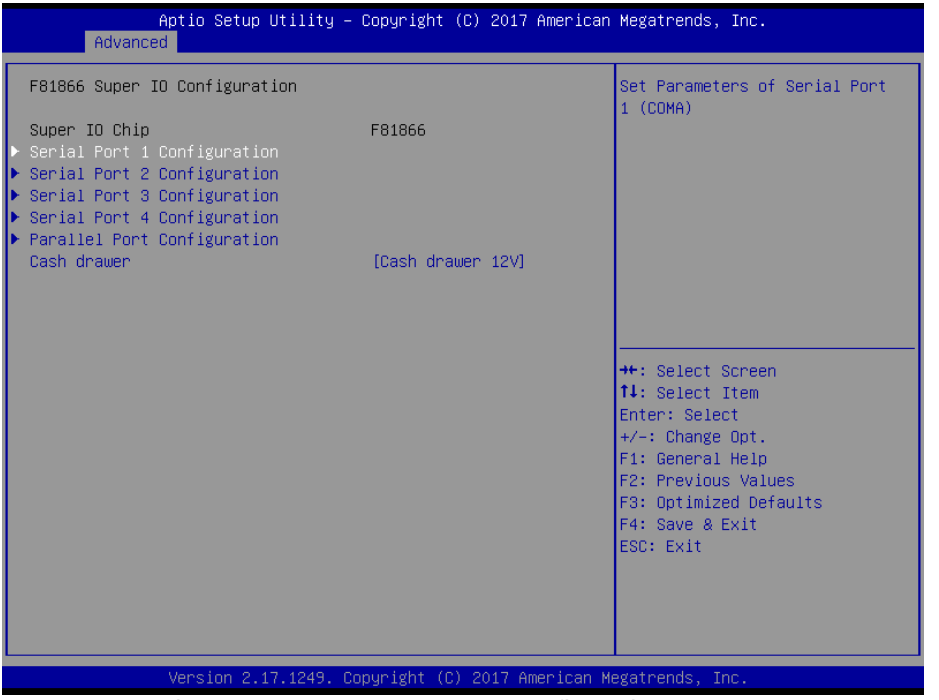


Figure 3-7. F81866 Super IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-menu	Configure the parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Sub-menu	Configure the parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Sub-menu	Configure the parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Sub-menu	Configure the parameters of Serial Port 4 (COMD).
Parallel Port Configuration	Sub-menu	Configure the parameters of Parallel Port (LPT/LPTE).
Cash Drawer	-Cash Drawer 12V -Cash Drawer 24V	Cash Drawer 12V or 24V selection

Serial Port 1 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 1 Configuration*

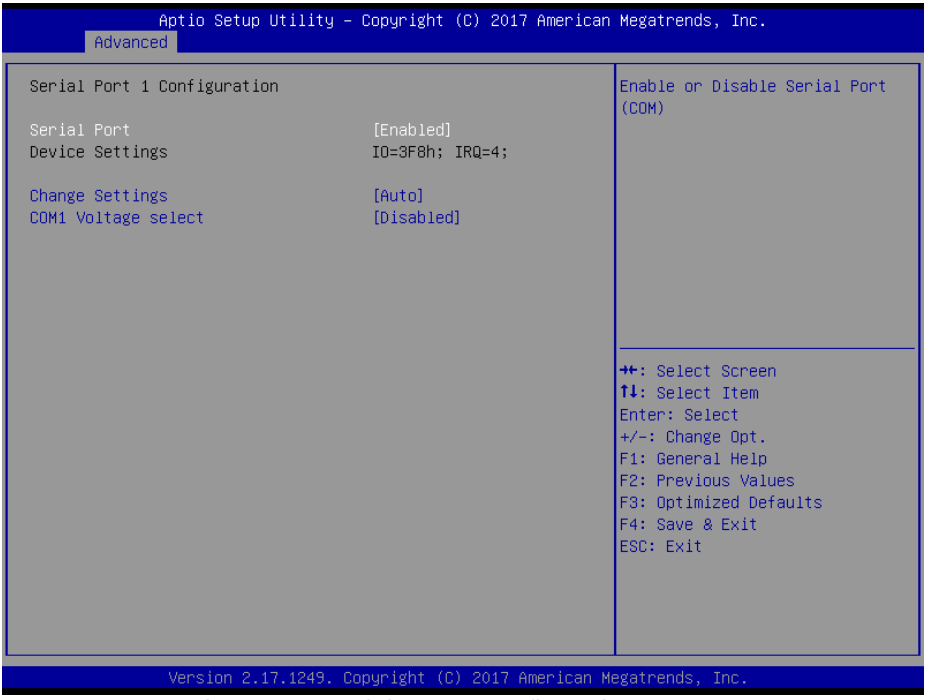


Figure 3-8. Serial Port 1 Configuration Screen

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

Serial Port 2 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 2 Configuration*

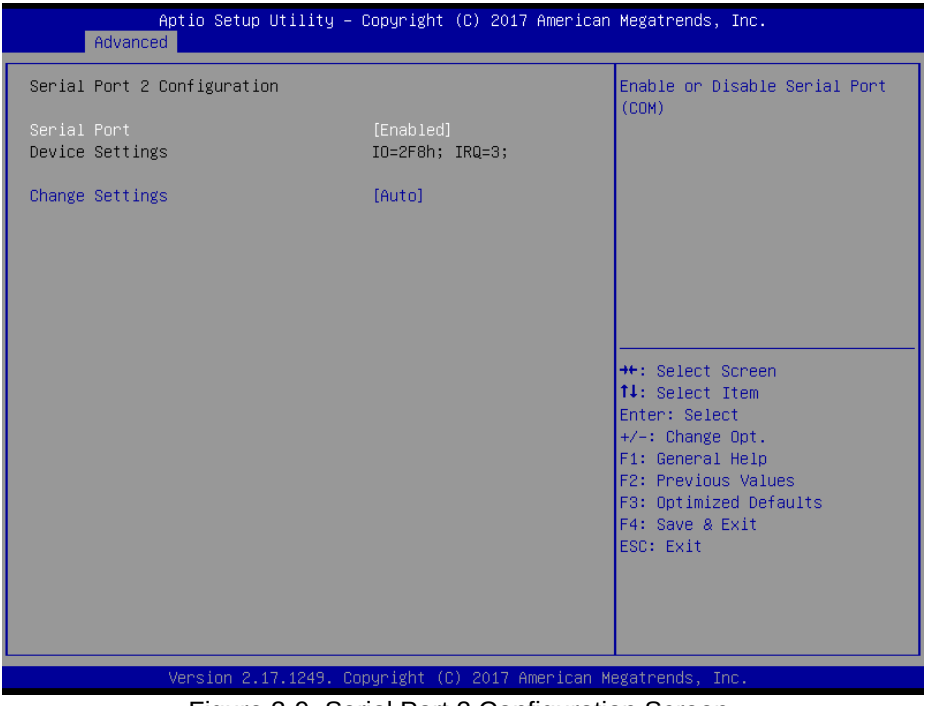


Figure 3-9. Serial Port 2 Configuration Screen

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

Serial Port 3 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 3 Configuration*

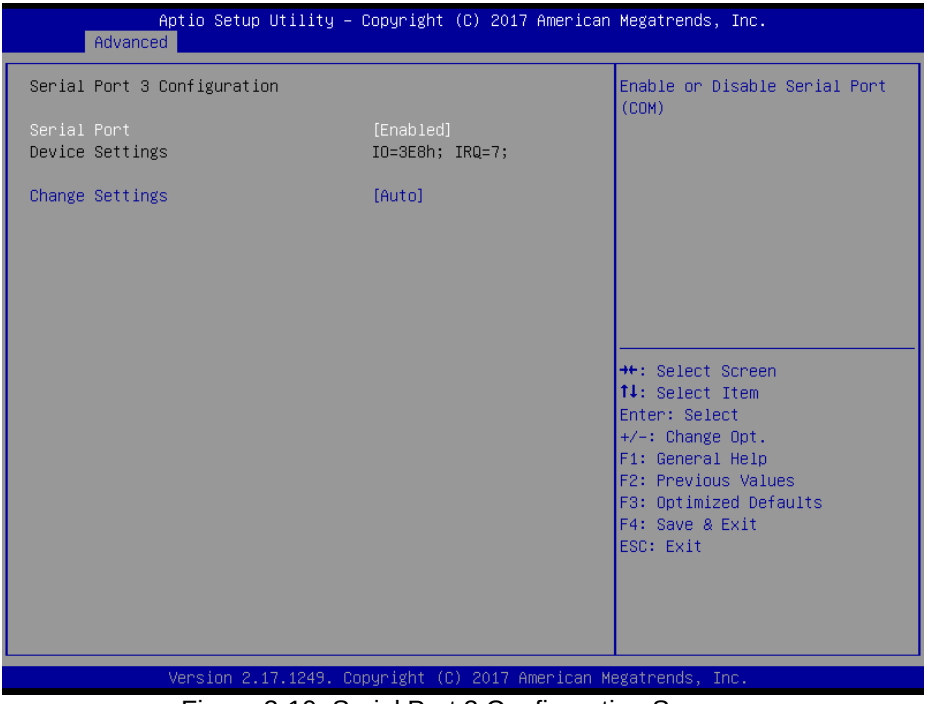


Figure 3-10. Serial Port 3 Configuration Screen

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

Serial Port 4 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 4 Configuration*

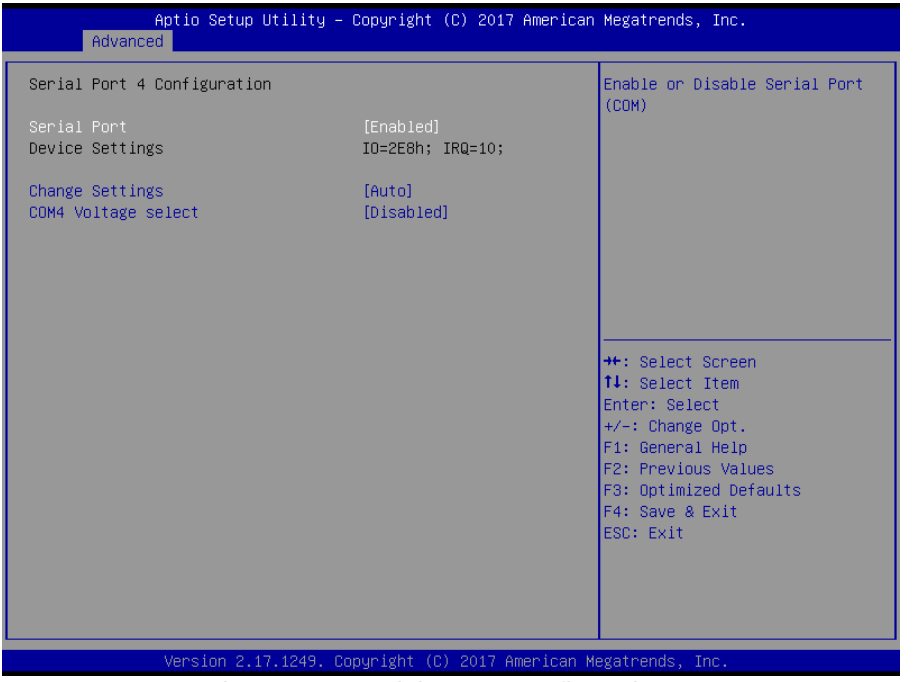


Figure 3-11. Serial Port 4 Configuration Screen

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

Parallel Port Configuration

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

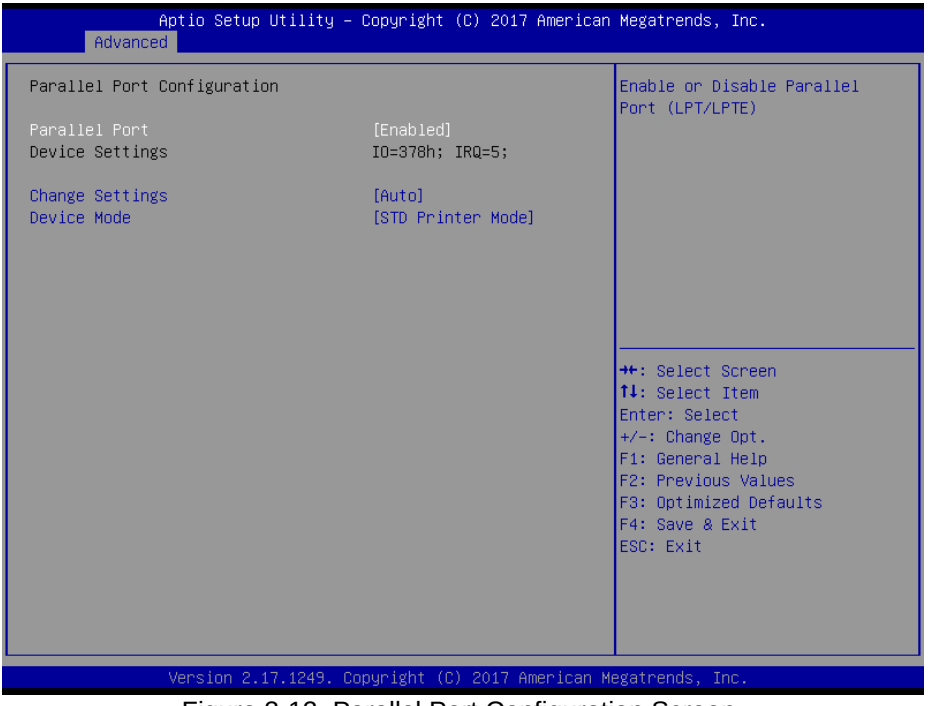


Figure 3-12. Parallel Port Configuration Screen

BIOS Setting	Options	Description/Purpose
Parallel Port	-Disabled -Enabled	Enable or disable Parallel Port.
Device Settings	No changeable options	Displays current settings of Parallel Port.
Change settings	-Auto -IO=378h; IRQ=5 -IO=378h; IRQ=5,6,7,9,10,11,12 -IO=278h; IRQ=5,6,7,9,10,11,12 -IO=3BCh; IRQ=5,6,7,9,10,11,12	Select IRQ and I/O resource for the parallel port.
Device Mode	-STD Printer Mode -SPP Mode -EPP-1.9 and SPP Mode -EPP-1.7 and SPP Mode	Change the printer port mode.

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

Advanced - Hardware Monitor

Menu Path *Advanced > Hardware Monitor*

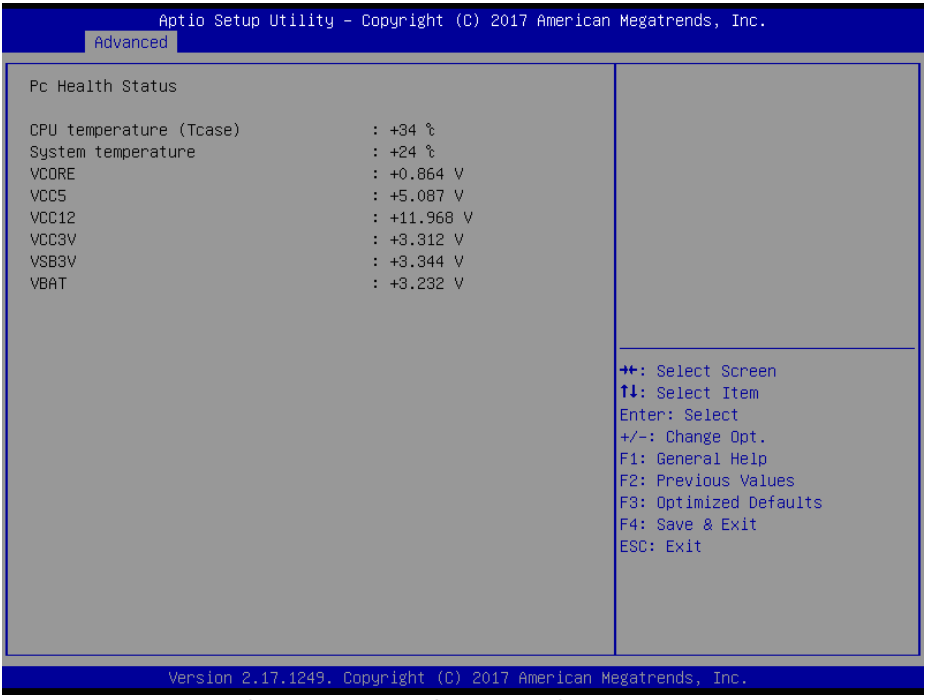


Figure 3-13. Hardware Monitor Screen

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

Advanced - F81866 Watchdog

Menu Path *Advanced > F81866 Watchdog*

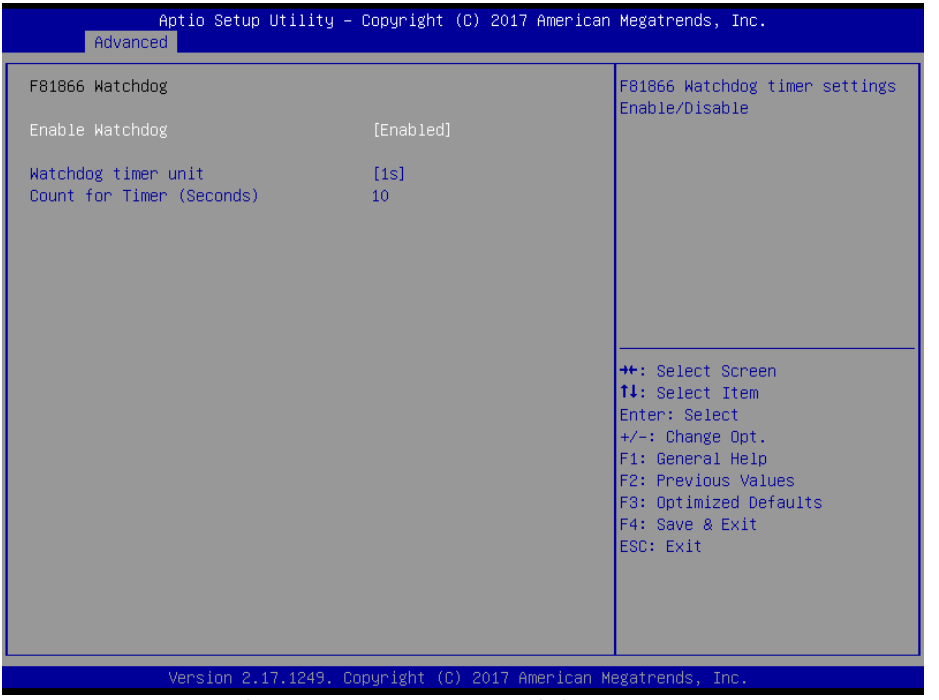


Figure 3-14. F81866 Watchdog Screen

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

Advanced - CPU Configuration

Menu Path *Advanced > CPU Configuration*

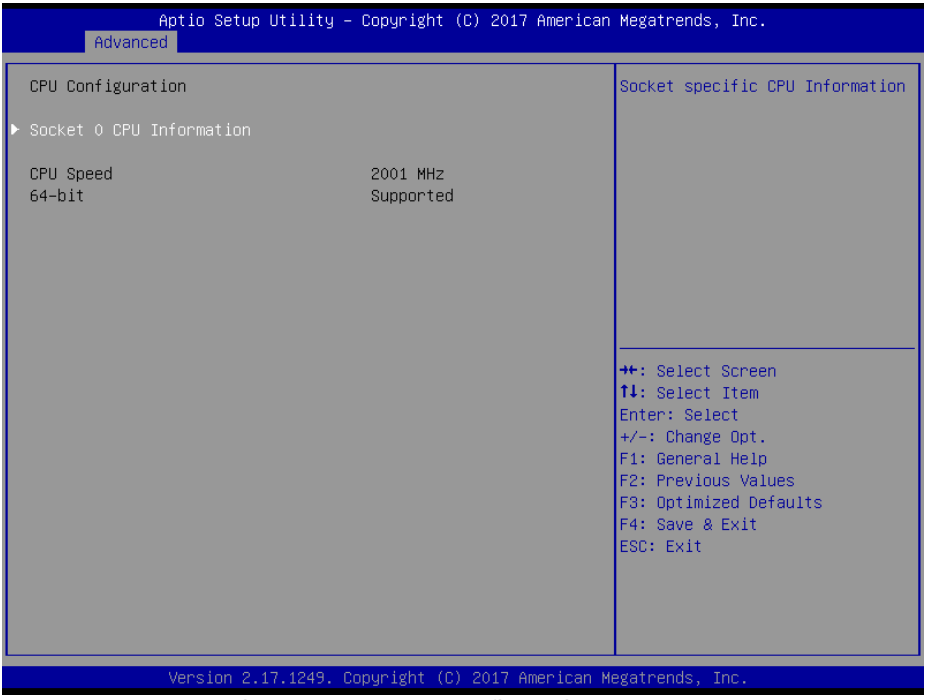


Figure 3-15. CPU Configuration Screen

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

Advanced - Socket 0 CPU Configuration

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

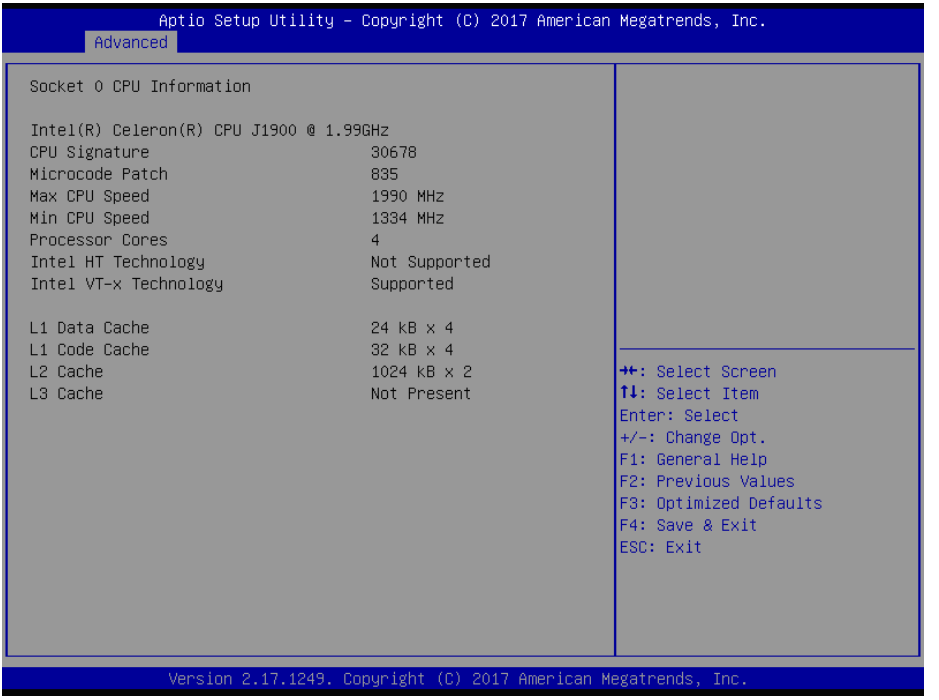


Figure 3-16. Socket 0 CPU Information Screen

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

Advanced - IDE Configuration

Menu Path *Advanced > IDE Configuration*

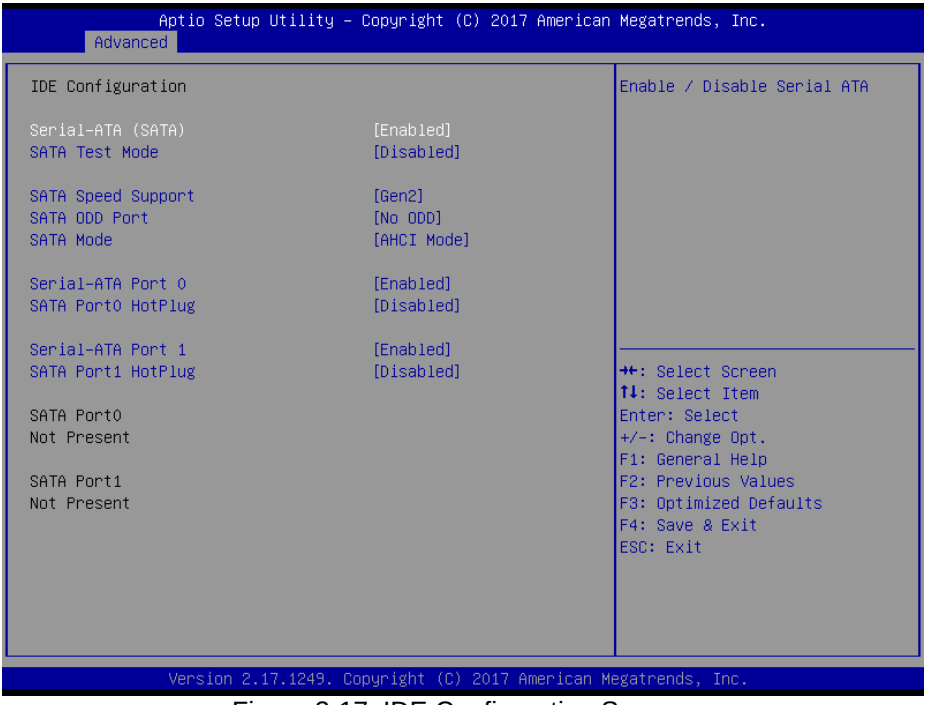


Figure 3-17. IDE Configuration Screen

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

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

Advanced - OS Selection

Menu Path *Advanced > OS Selection*

Figure 3-18. OS Selection Screen

BIOS Setting	Options	Description/Purpose
OS Selection	- Windows 7 - Windows 8.X - Windows 10	OS Selection

Advanced - CSM Configuration

Menu Path *Advanced > CSM Configuration*

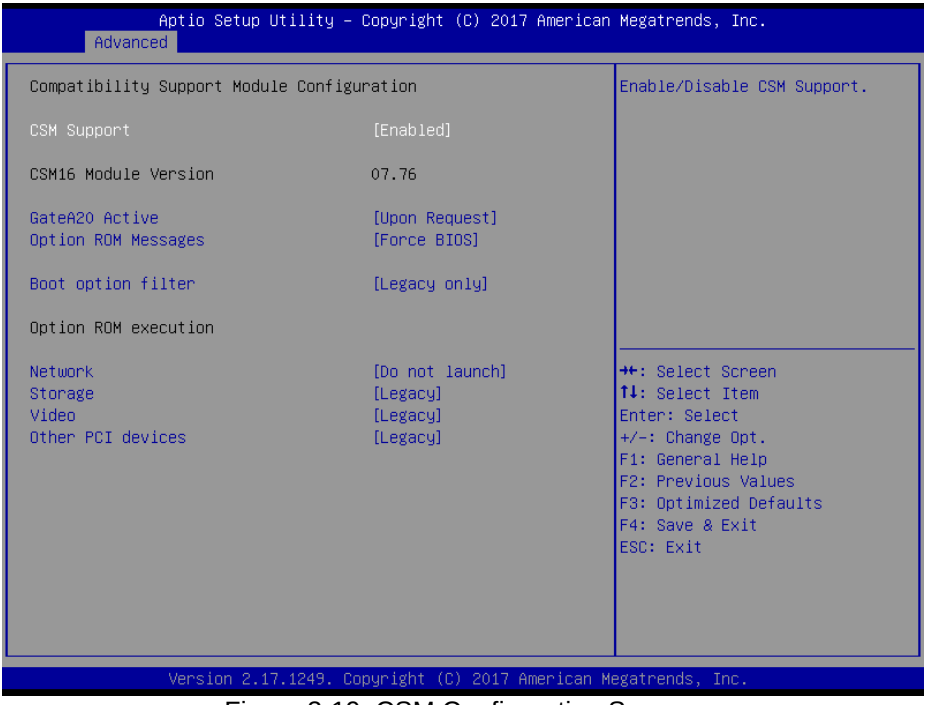


Figure 3-19. CSM Configuration Screen

BIOS Setting	Options	Description/Purpose
CSM Support	- Disabled - Enabled	Disable or enable CSM support.
CSM16 Module Version	No changeable options	Displays the current CSM (Compatibility Support Module) version.
GateA20 Active	- Upon Request - Always	Select Gate A20 operation mode. • **Upon Request:** GA20 can be disabled via BIOS services. • **Always:** Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	- Force BIOS - Keep Current	Set the display mode for Option ROM messages.
Boot option filter	- UEFI and Legacy	This option controls what kind of devices

BIOS Setting	Options	Description/Purpose
	- Legacy only - UEFI only	the system can boot.
Network	- UEFI and Legacy - Legacy	Controls the execution of UEFI or Legacy PXE.
Storage	- Do not launch - UEFI - Legacy	Controls the execution of UEFI or Legacy Storage.
Video	- Do not launch - UEFI - Legacy	Controls the execution of UEFI and Legacy Video.
Other PCI devices	- Do not launch - UEFI - Legacy	Select the launch method for other PCI devices, such as NIC, mass storage or video card.

Advanced - USB Configuration

Menu Path *Advanced > USB Configuration*

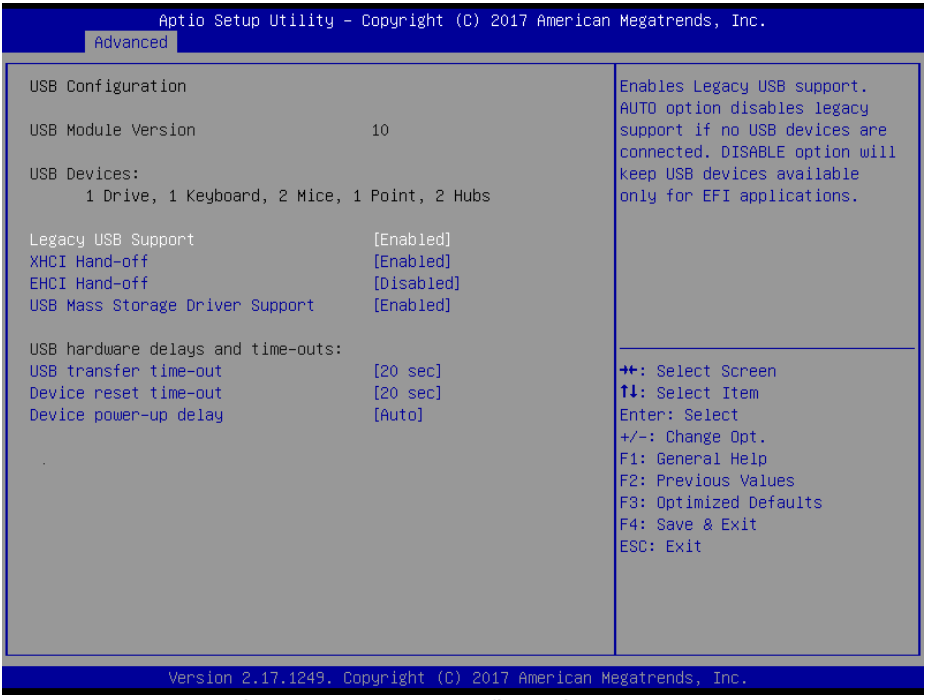


Figure 3-20. USB Configuration Screen

BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays number of available USB devices.
Legacy USB Support	- Disabled - Enabled - Auto	Enables support for legacy USB.
XHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without XHCI hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without EHCI hand-off support.
USB Mass Storage Driver Support	- Disabled - Enabled	Enable/Disable USB mass storage driver support.
USB transfer time-out	1 / 5 / 10 /20 sec	The time-out value for Control, Bulk, and Interrupt transfers.

BIOS Setting	Options	Description/Purpose
Device reset time-out	10 / 20 / 30 / 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	- Auto - Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

3.4.2.2 Chipset

Menu Path *Chipset*

Figure 3-21. Chipset Menu Screen

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

North Bridge

Menu Path *Chipset > North Bridge*

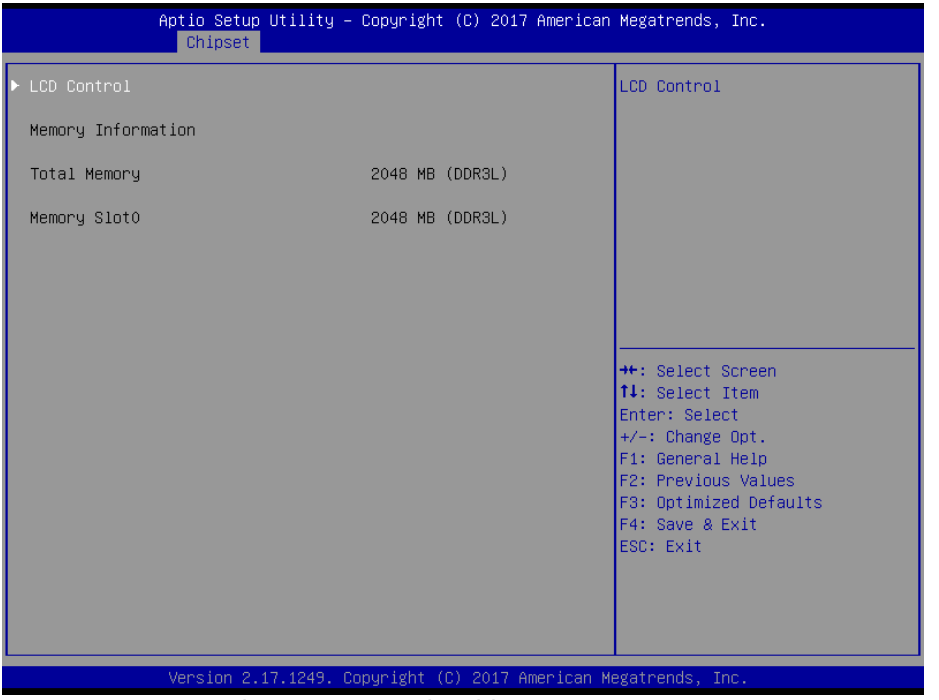


Figure 3-22. North Bridge Menu Screen

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

North Bridge - LCD Control

Menu Path *Chipset > North Bridge > LCD Control*

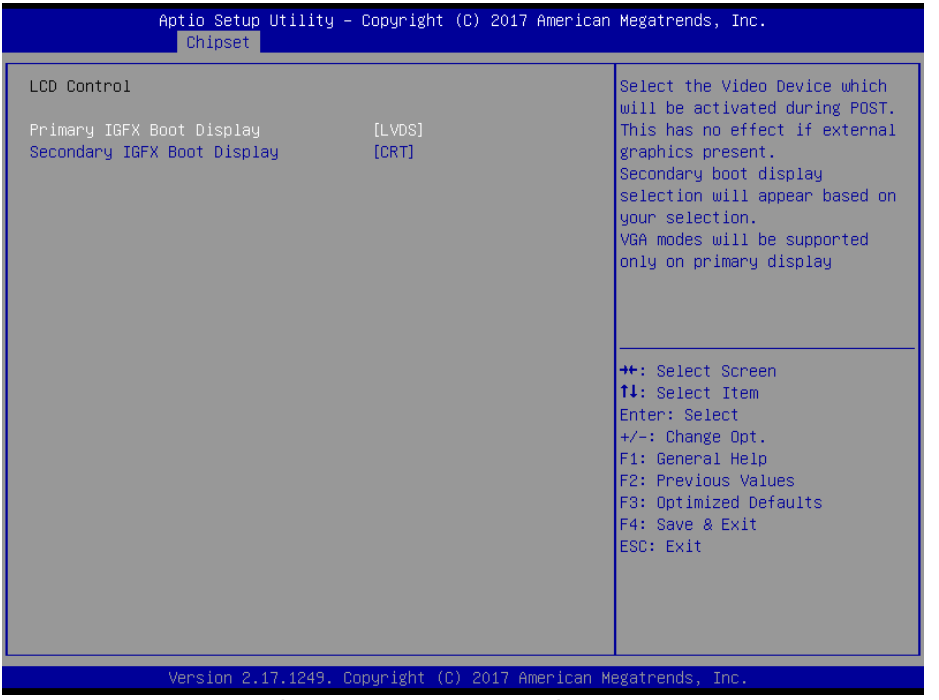


Figure 3-23. LCD Control Screen

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

South Bridge

Menu Path *Chipset > South Bridge*

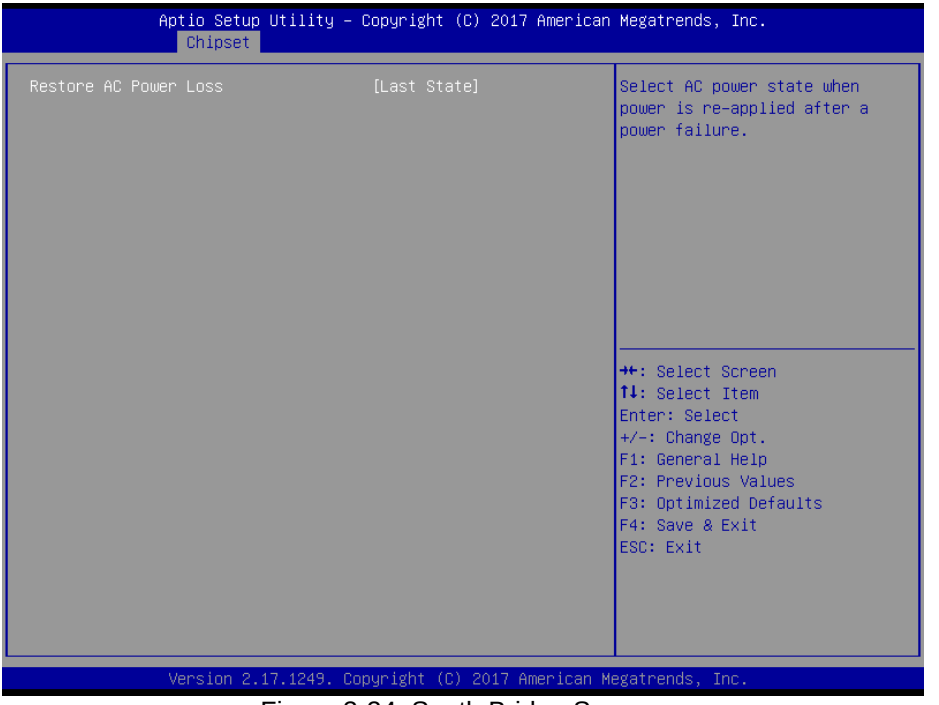


Figure 3-24. South Bridge Screen

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

3.4.2.3 Security

Menu Path *Security*

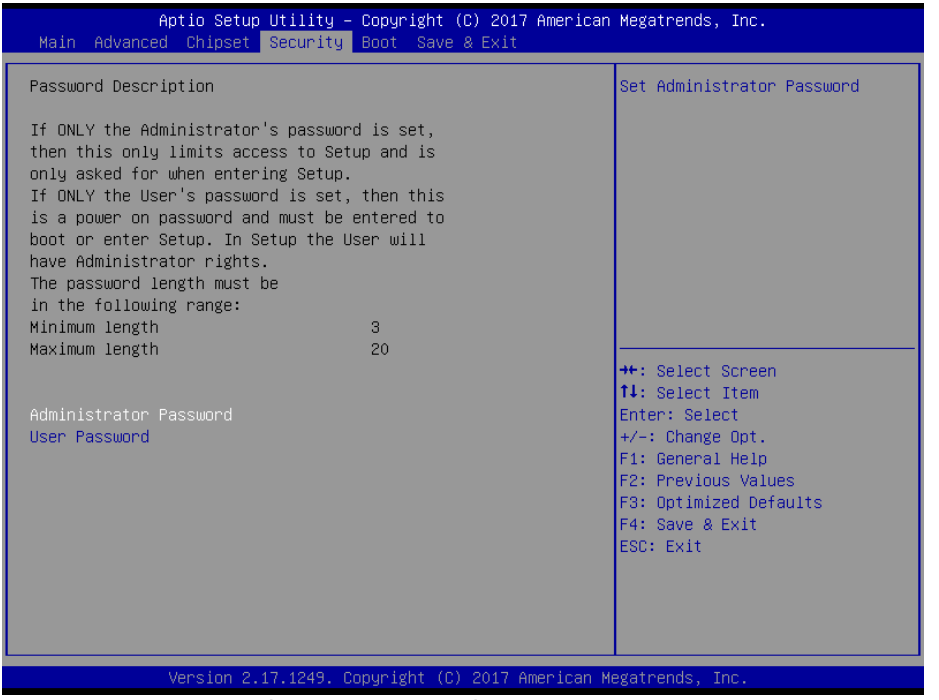


Figure 3-25. Security Menu Screen

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

3.4.2.4 Boot

Menu Path *Boot*

Figure 3-26. Boot Menu Screen

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

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

Boot - Hard Drive BBS Priorities

Menu Path *Boot > Hard Drive BBS Priorities*

Figure 3-27. Hard Drive BBS Priorities Screen

BIOS Setting	Options	Description/Purpose
Boot Option #1~#n	- [Drive(s)] - Enabled	Selects the system boot for hard Device.

3.4.2.5 Save & Exit

Menu Path *Save & Exit*

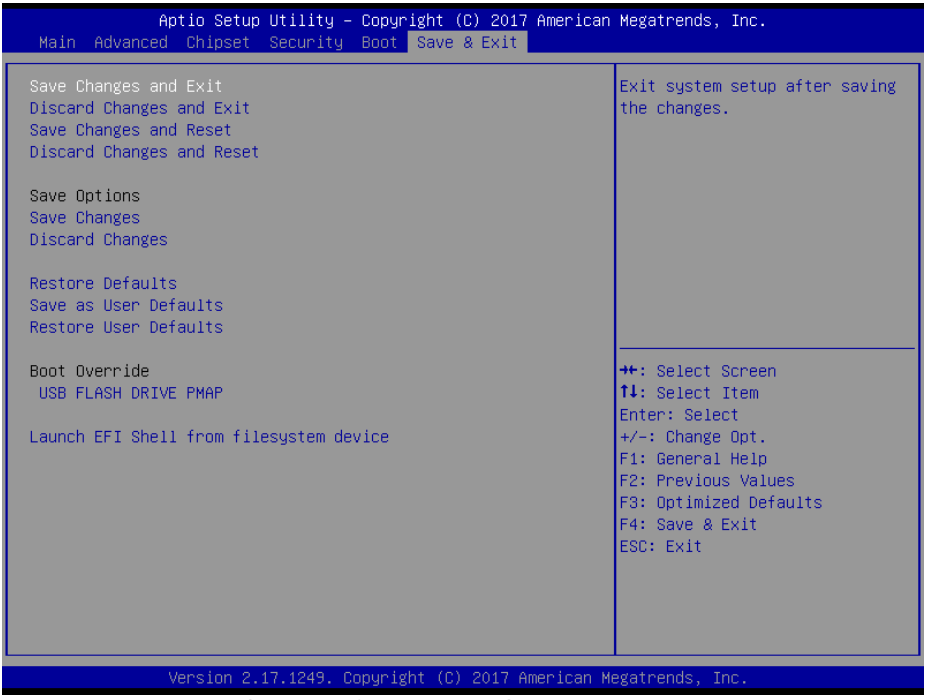


Figure 3-28. Save & Exit Menu Screen

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	Save Changes to any setup options..
Discard Changes	No changeable options	Discard Changes to any setup options.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User	No changeable options	Save the changesas User Defaults.

BIOS Setting	Options	Description/Purpose
Defaults		
Restore User Defaults	No changeable options	Restore User Defaults to all the setup options.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

3.4.3 Configuring WatchDog Timer

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

Configuration Sequence

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

(1) Enter the Extended Function Mode

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

(2) Configure the Configuration Registers

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

(3) Exit the Extended Function Mode

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

Code Example for Watchdog Timer

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

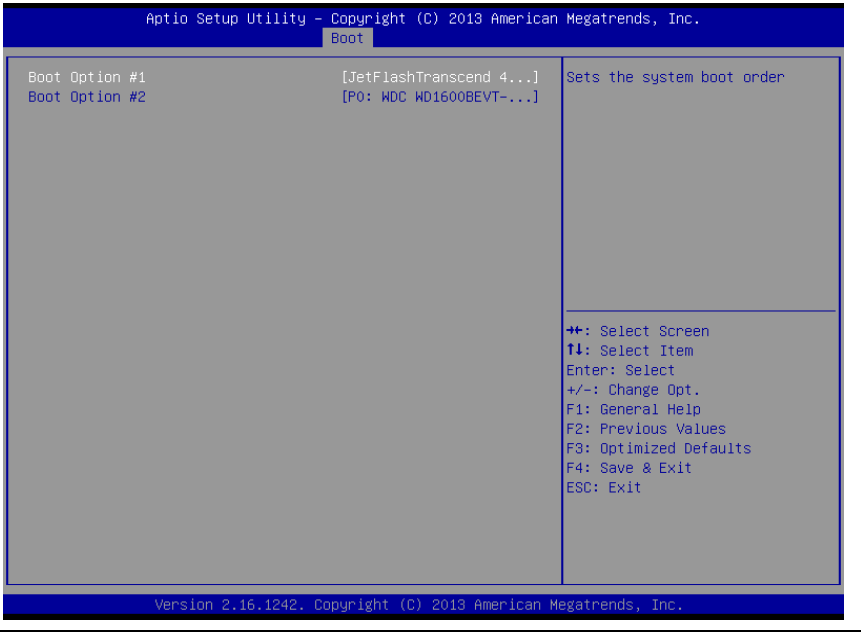
```
; ------------------------ Enter to extended function mode
mov                 dx,                 2eh
mov                 al,                 87h
out                 dx,                 al
out                 dx,                 al
; ---------------------- Select Logical Device 7 of watchdog timer
```

```
mov             al,             07h
out             dx,             al
inc             dx
mov             al,             07h
out             dx,             al
;---------------------------------Enable Watch dog feature
mov             al,             030h
out             dx,             al
inc             dx
mov             al,             01h
out             dx,             al
;------------------------------ Enable Watch PME--------------------------
dec             dx
mov             al,             0FAh
out             dx,             al
inc             dx
in              al,             dx
and             al,             51h
out             dx,             al
;-------------------------- Set second as counting unit
dec             dx
mov             al,             0f5h
out             dx,             al
inc             dx
in              al,             dx
and             al,             30h
out             dx,             al
; ---------- Set timeout interval as 30seconds and start counting ---
dec             dx
mov             al,             0f6h
out             dx,             al
inc             dx
mov             al,             1Eh
out             dx,             al
;---------------------------------Exit the extended function mode
dec             dx
mov             al,             0aah
out             dx,             al
```

3.4.4 Update Procedure

I. Prerequisites

1. Prepare a bootable media (e.g. USB storage device) which can boot the system to DOS prompt.
2. Download and save the BIOS file (e.g. 67221PD1.bin) to the bootable device.
3. Copy AMI flash utility – AFUDOS.exe (V5.07.01) into the bootable device
4. Make sure the target system can first boot to the bootable device.
   (1) Connect the bootable USB device.
   (2) Turn on the computer and press <Del> or <Esc> key during boot to enter BIOS setup menu.
   (3) The system will go into the BIOS setup menu.
   (4) Select [Boot] menu as the picture shown below.
   (5) Select [Hard Drive BBS Priorities] and set the USB bootable device as the 1st boot device.
   (6) Press <F4> key to save the configuration and exit the BIOS setup menu.



II. AFUDOS Command for System BIOS Update

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

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

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

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

III. BIOS Update Procedure

1. Use the bootable USB device to boot up the system into the DOS command prompt.
2. Type in AFUDOS 6722xxxx.bin /p /b /n /x and press Enter to start the flash procedure.
   Note: xxxx means the BIOS revision part, ex. 1PD1…

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

```
C:\> AFUDOS 67221PD1.bin /p /b /n /x
+-------------------------------------------------------------------------+
|             AMI Firmware Update Utility  v5.07.01                       |
|   Copyright (C) 2014 American Megatrands Inc. All Rights Reserved.      |
+-------------------------------------------------------------------------+
  Reading flash ..... done
  - ME Data Size Checking . ok
  - FFS checksums ..... ok
  Erasing Boot Block ..... done
  Updating Boot Block ..... done
  Verifying Boot Block ..... done
  Erasing Main Block ..... done
  Updating Main Block ..... done
  Verifying Main Block ..... done
  Erasing NVRAM Block ..... done
  Updating NVRAM Block ..... done
  Verifying NVRAM Block ..... done

C:>_
```

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.

3.4.5 Resource Map

3.4.5.1 Interrupt Map

IRQ	Assignment
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 7	Communications Port (COM3)
IRQ 8	High precision event timer
IRQ 10	Communications Port (COM4)
IRQ 10	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
IRQ 12	PS/2 Compatible Mouse
IRQ 16	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
IRQ 17	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
IRQ 18	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
IRQ 22	High Definition Audio Controller
IRQ 81	Microsoft ACPI-Compliant System
IRQ 82	Microsoft ACPI-Compliant System
IRQ 83	Microsoft ACPI-Compliant System
IRQ 84	Microsoft ACPI-Compliant System
IRQ 85	Microsoft ACPI-Compliant System
IRQ 86	Microsoft ACPI-Compliant System
IRQ 87	Microsoft ACPI-Compliant System
IRQ 88	Microsoft ACPI-Compliant System
IRQ 89	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 90	Microsoft ACPI-Compliant System
IRQ 91	Microsoft ACPI-Compliant System
IRQ 92	Microsoft ACPI-Compliant System
IRQ 93	Microsoft ACPI-Compliant System
IRQ 94	Microsoft ACPI-Compliant System
IRQ 95	Microsoft ACPI-Compliant System
IRQ 96	Microsoft ACPI-Compliant System
IRQ 97	Microsoft ACPI-Compliant System
IRQ 98	Microsoft ACPI-Compliant System
IRQ 99	Microsoft ACPI-Compliant System
IRQ 100	Microsoft ACPI-Compliant System
IRQ 101	Microsoft ACPI-Compliant System
IRQ 102	Microsoft ACPI-Compliant System
IRQ 103	Microsoft ACPI-Compliant System
IRQ 104	Microsoft ACPI-Compliant System
IRQ 105	Microsoft ACPI-Compliant System
IRQ 106	Microsoft ACPI-Compliant System
IRQ 107	Microsoft ACPI-Compliant System
IRQ 108	Microsoft ACPI-Compliant System
IRQ 109	Microsoft ACPI-Compliant System
IRQ 110	Microsoft ACPI-Compliant System
IRQ 111	Microsoft ACPI-Compliant System
IRQ 112	Microsoft ACPI-Compliant System
IRQ 113	Microsoft ACPI-Compliant System
IRQ 114	Microsoft ACPI-Compliant System
IRQ 115	Microsoft ACPI-Compliant System
IRQ 116	Microsoft ACPI-Compliant System
IRQ 117	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 118	Microsoft ACPI-Compliant System
IRQ 119	Microsoft ACPI-Compliant System
IRQ 120	Microsoft ACPI-Compliant System
IRQ 121	Microsoft ACPI-Compliant System
IRQ 122	Microsoft ACPI-Compliant System
IRQ 123	Microsoft ACPI-Compliant System
IRQ 124	Microsoft ACPI-Compliant System
IRQ 125	Microsoft ACPI-Compliant System
IRQ 126	Microsoft ACPI-Compliant System
IRQ 127	Microsoft ACPI-Compliant System
IRQ 128	Microsoft ACPI-Compliant System
IRQ 129	Microsoft ACPI-Compliant System
IRQ 130	Microsoft ACPI-Compliant System
IRQ 131	Microsoft ACPI-Compliant System
IRQ 132	Microsoft ACPI-Compliant System
IRQ 133	Microsoft ACPI-Compliant System
IRQ 134	Microsoft ACPI-Compliant System
IRQ 135	Microsoft ACPI-Compliant System
IRQ 136	Microsoft ACPI-Compliant System
IRQ 137	Microsoft ACPI-Compliant System
IRQ 138	Microsoft ACPI-Compliant System
IRQ 139	Microsoft ACPI-Compliant System
IRQ 140	Microsoft ACPI-Compliant System
IRQ 141	Microsoft ACPI-Compliant System
IRQ 142	Microsoft ACPI-Compliant System
IRQ 143	Microsoft ACPI-Compliant System
IRQ 144	Microsoft ACPI-Compliant System
IRQ 145	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 146	Microsoft ACPI-Compliant System
IRQ 147	Microsoft ACPI-Compliant System
IRQ 148	Microsoft ACPI-Compliant System
IRQ 149	Microsoft ACPI-Compliant System
IRQ 150	Microsoft ACPI-Compliant System
IRQ 151	Microsoft ACPI-Compliant System
IRQ 152	Microsoft ACPI-Compliant System
IRQ 153	Microsoft ACPI-Compliant System
IRQ 154	Microsoft ACPI-Compliant System
IRQ 155	Microsoft ACPI-Compliant System
IRQ 156	Microsoft ACPI-Compliant System
IRQ 157	Microsoft ACPI-Compliant System
IRQ 158	Microsoft ACPI-Compliant System
IRQ 159	Microsoft ACPI-Compliant System
IRQ 160	Microsoft ACPI-Compliant System
IRQ 161	Microsoft ACPI-Compliant System
IRQ 162	Microsoft ACPI-Compliant System
IRQ 163	Microsoft ACPI-Compliant System
IRQ 164	Microsoft ACPI-Compliant System
IRQ 165	Microsoft ACPI-Compliant System
IRQ 166	Microsoft ACPI-Compliant System
IRQ 167	Microsoft ACPI-Compliant System
IRQ 168	Microsoft ACPI-Compliant System
IRQ 169	Microsoft ACPI-Compliant System
IRQ 170	Microsoft ACPI-Compliant System
IRQ 171	Microsoft ACPI-Compliant System
IRQ 172	Microsoft ACPI-Compliant System
IRQ 173	Microsoft ACPI-Compliant System

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

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

3.4.5.2 I/O MAP

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

I/O MAP	ASSIGNMENT
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000378-0x0000037F	Printer Port (LPT1)
0x000003B0-0x000003BB	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003C0-0x000003DF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x0000E000-0x0000EFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
0x0000E000-0x0000EFFF	Realtek PCIe GBE Family Controller
0x0000F000-0x0000F01F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12

I/O MAP	ASSIGNMENT
0x0000F020-0x0000F03F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000F040-0x0000F043	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000F050-0x0000F057	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000F060-0x0000F063	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000F070-0x0000F077	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000F080-0x0000F087	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x00000000-0x0000006F	PCI bus

3.4.5.3 DMA Channels Map

TIMER CHANNEL	ASSIGNMENT
Channel 3	Printer Port (LPT1)

3.4.5.4 Memory Map

MEMORY MAP	ASSIGNMENT
0xD0600000-0xD06FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
0xD0600000-0xD06FFFFF	Realtek PCIe GBE Family Controller
0xFF000000-0xFFFFFFFF	Intel(R) 82802 Firmware Hub Device
0xE00000D0-0xE00000DB	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor MBI Device - 33BD
0xD0716000-0xD07167FF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0xD0000000-0xD03FFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0xC0000000-0xCFFFFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0xC0000000-0xCFFFFFFF	PCI bus
0xFED00000-0xFED003FF	High precision event timer
0xD0604000-0xD0604FFF	Realtek PCIe GBE Family Controller
0xD0700000-0xD070FFFF	Intel(R) USB 3.0 eXtensible Host Controller
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xD0710000-0xD0713FFF	High Definition Audio Controller
0xD0714000-0xD071401F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
0xD0500000-0xD05FFFFF	Intel(R) Trusted Execution Engine Interface
0xD0400000-0xD04FFFFF	Intel(R) Trusted Execution Engine Interface
0xA0000-0xBFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

MEMORY MAP	ASSIGNMENT
0xA0000-0xBFFFF	PCI bus
0xC0000-0xDFFFF	PCI bus
0xE0000-0xFFFFF	PCI bus
0xD0600000-0xD06FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
0xD0600000-0xD06FFFFF	Realtek PCIe GBE Family Controller
0xFF000000-0xFFFFFFFF	Intel(R) 82802 Firmware Hub Device
0xE00000D0-0xE00000DB	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor MBI Device - 33BD
0xD0716000-0xD07167FF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0xD0000000-0xD03FFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0xC0000000-0xCFFFFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0xC0000000-0xCFFFFFFF	PCI bus
0xFED00000-0xFED003FF	High precision event timer
0xD0604000-0xD0604FFF	Realtek PCIe GBE Family Controller
0xD0700000-0xD070FFFF	Intel(R) USB 3.0 eXtensible Host Controller

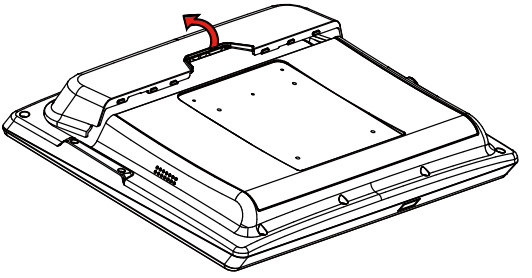
Appendix A System Diagrams

This appendix includes the exploded diagrams and part numbers of the PA-5822 system components. The following topics are included:

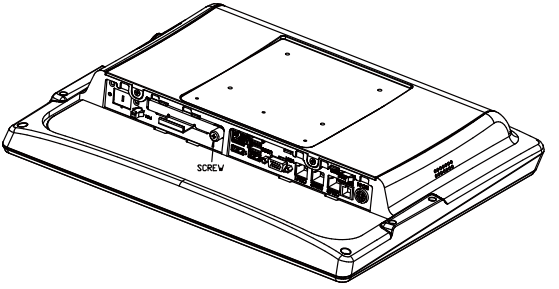
- **Easy Maintenance**
  - HDD Tray Disassembly
  - MSR module Assembly
  - i-Button module Assembly
  - Fingerprint module Assembly
  - Arrangement of the cable
- **Capacitive Touch Screen Exploded diagram**
  - Front Cover Module Exploded Diagram
  - Panel Module Exploded Diagram
  - Motherboard Exploded Diagram
  - Back Cover Exploded Diagram
  - Exploded Diagram For Panel PC HDD Assembly
  - AI Cover Exploded Diagram
  - I/O Module Exploded Diagram
- **Resistive Touch Screen Exploded diagram**
  - Front Cover Module Exploded Diagram
  - Panel Module Exploded Diagram
  - Motherboard Exploded Diagram
  - Back Cover Exploded Diagram
  - Exploded Diagram For Panel PC HDD Assembly
  - AI Cover Exploded Diagram
  - I/O Module Exploded Diagram
  - I-Button Exploded Diagram
  - RFID Module Exploded Diagram
  - RJ11 Cable Exploded Diagram
  - Barcode Scanner Kit Exploded Diagram
  - Print Power Cable Exploded Diagram
  - Fingerprint Module Exploded Diagram
  - MSR Module Exploded Diagram
  - Stand Module Exploded Diagram

HDD Tray Disassembly

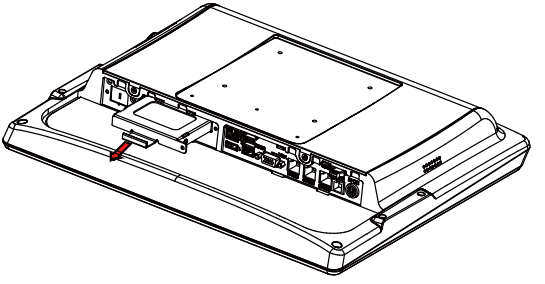
Step1: Rotata the cable cover



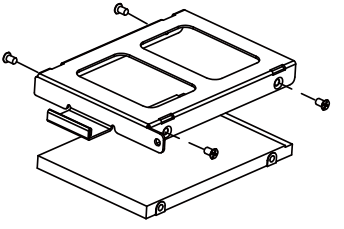
Step2: Unassemble the screw



Step3: Pull out HDD Tray.

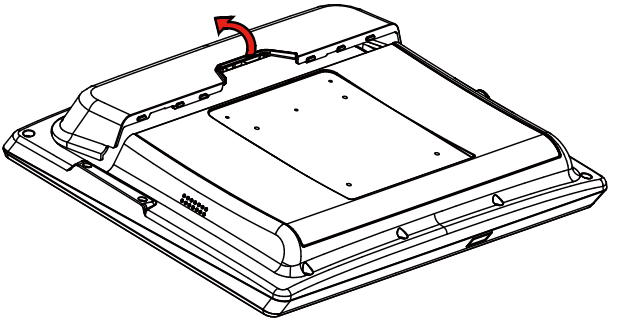


Step4: Unassemble the HDD fixing screw and take off the HDD tray.

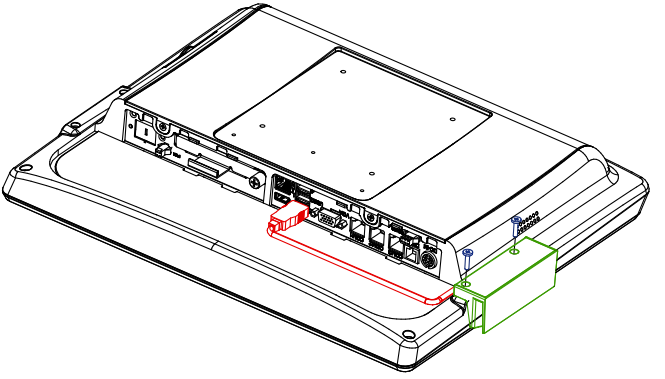


MSR module Assembly

Step1: Rotata the cable cover

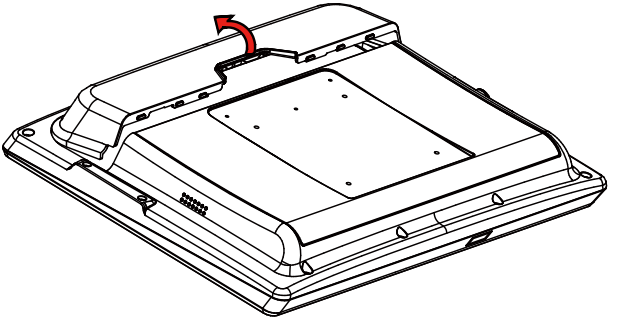


Step2: Fix MSR module by 2 screw and insert connector into USB port

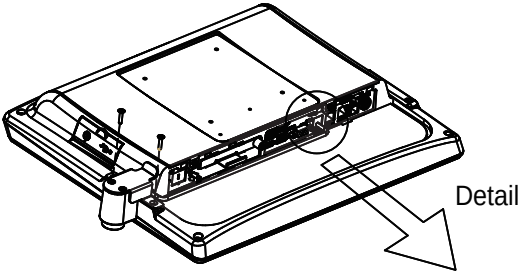


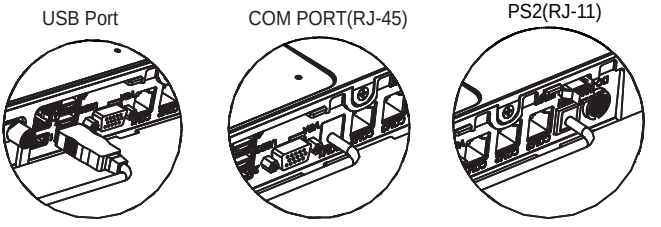
i-Button module Assembly

Step1: Rotata the cable cover



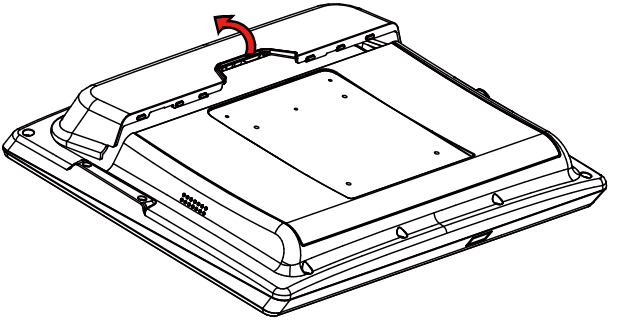
Step 2. Fix i-Button module by 2 screws and insert the connector into I/O port (USB, COM, PS/2)



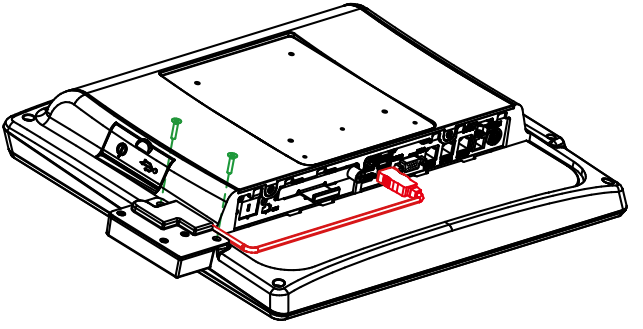


Fingerprint module Assembly

Step1: Rotata the cable cover

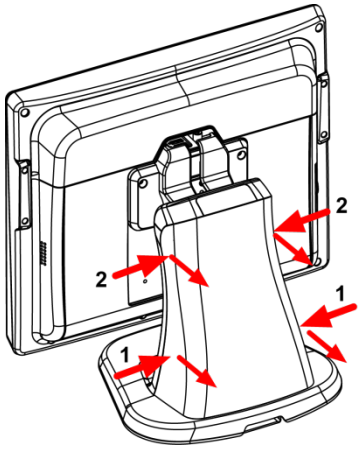


Step 2. Fix Fingerprint module by 2 screws and insert the connector into USB port.

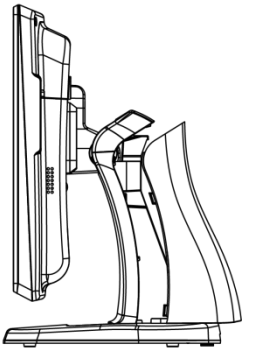


Arrangement of the cable

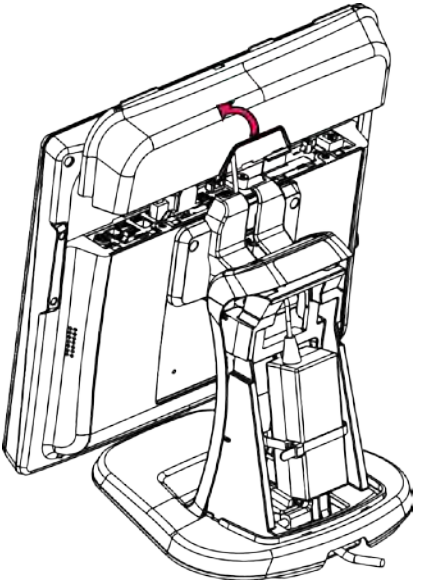
Step 1. Open rear cover



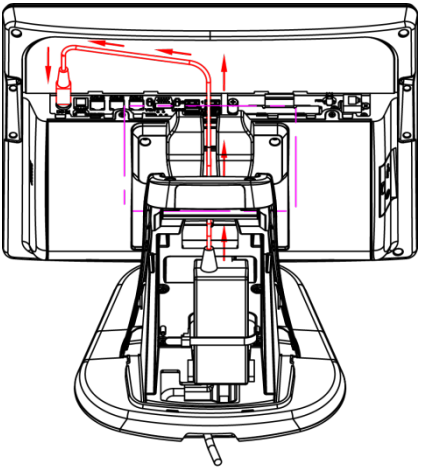
1. Press both bottom side of rear cover simultaneously.
2. Press the both up side of rear cover simultaneously.



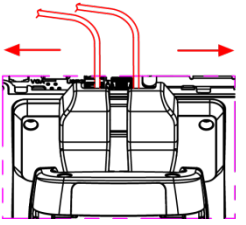
Step 2. Remove cable cover



Step 3. Plug in power DIN cable and cabling.

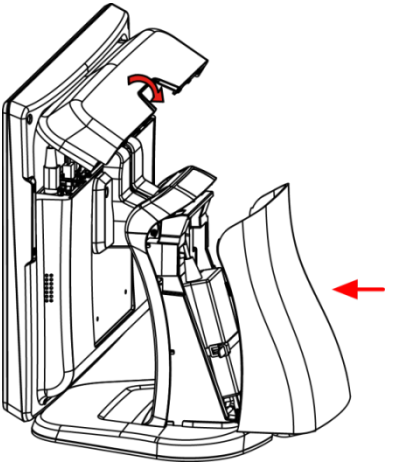


Adapter cable through wire hole of stand and plug in DC-IN connector



Cable can plug in from left wire hole or right wire hole.

Step 4. Close all covers and lock screws.

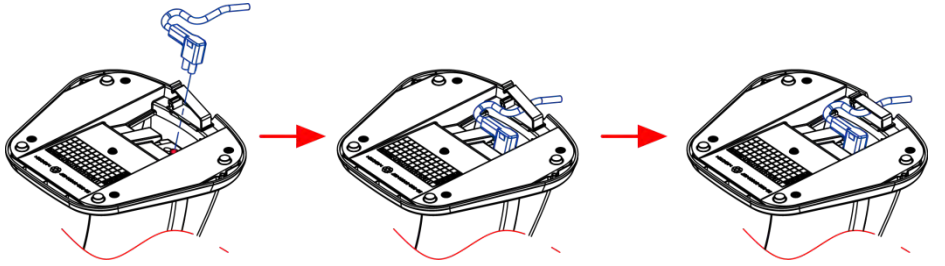


Step 5. Plug power cable in.

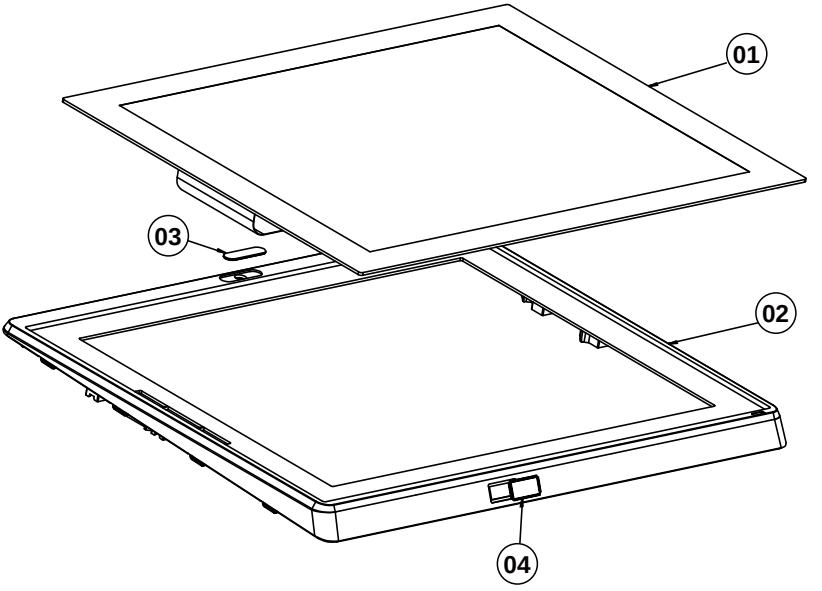
Plug power cable into adapter.

Power cable passes through wire hole.

Buckle up the wire buckle.

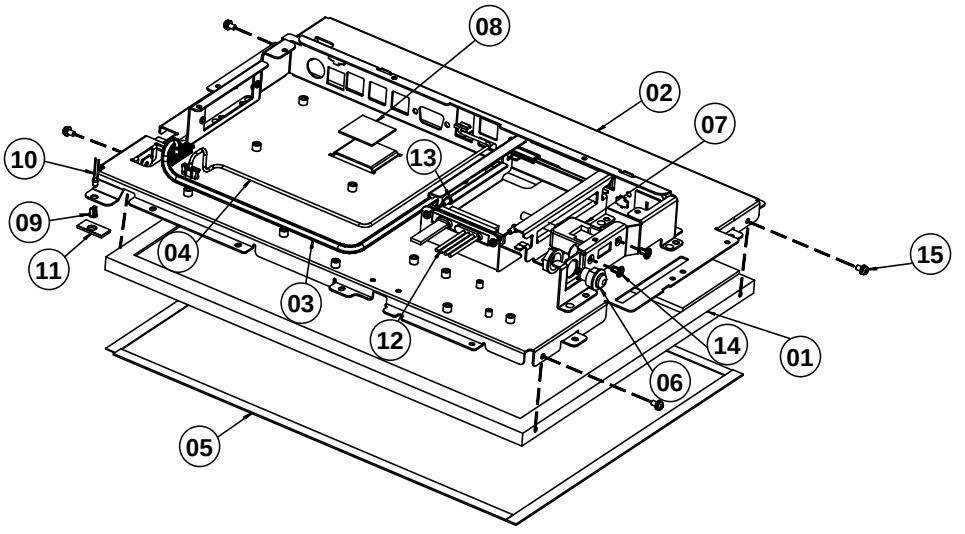


Front Cover Module Exploded Diagram (Capacitive Touch Screen)



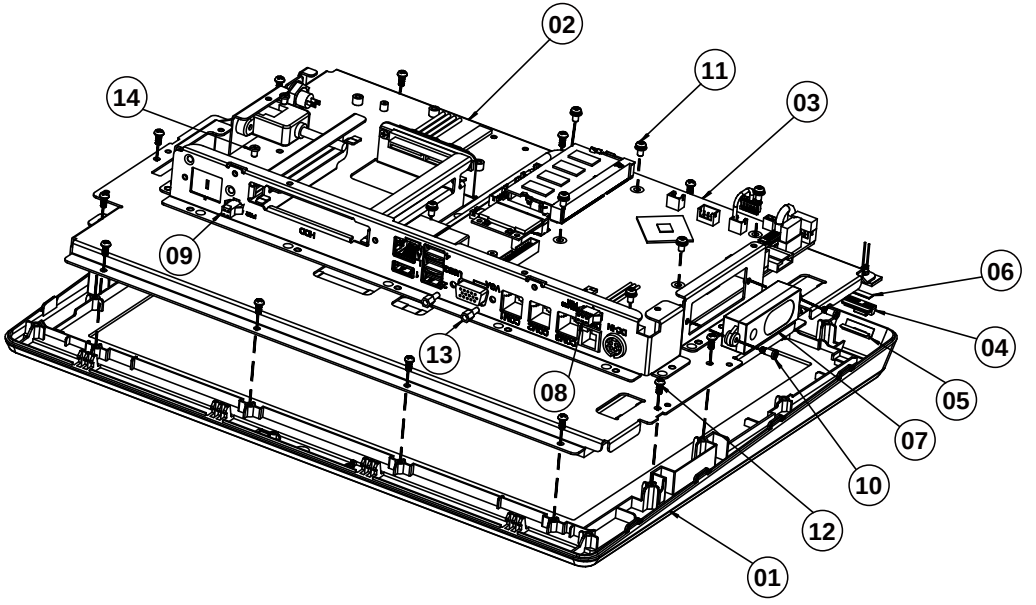
No.	Component Name	P/N No.	Q'ty
1	15" Capacitive Touch panel, USB interface	52-380-00001723	1
2	PA-5822 Front Cover (Black)	30-002-28112407	1
	PA-5822 Front Cover (NKC White)	30-002-28113407	1
3	Camera Lens (Black) (Opaque)	90-021-10150393	1
	Camera Lens (White) (Opaque)	90-021-10130393	1
4	Barcode Lens (Opaque)	30-021-10230378	1
	Barcode Lens White (Opaque)	90-021-10230407	1

Panel Module Exploded Diagram (Capacitive Touch Screen)



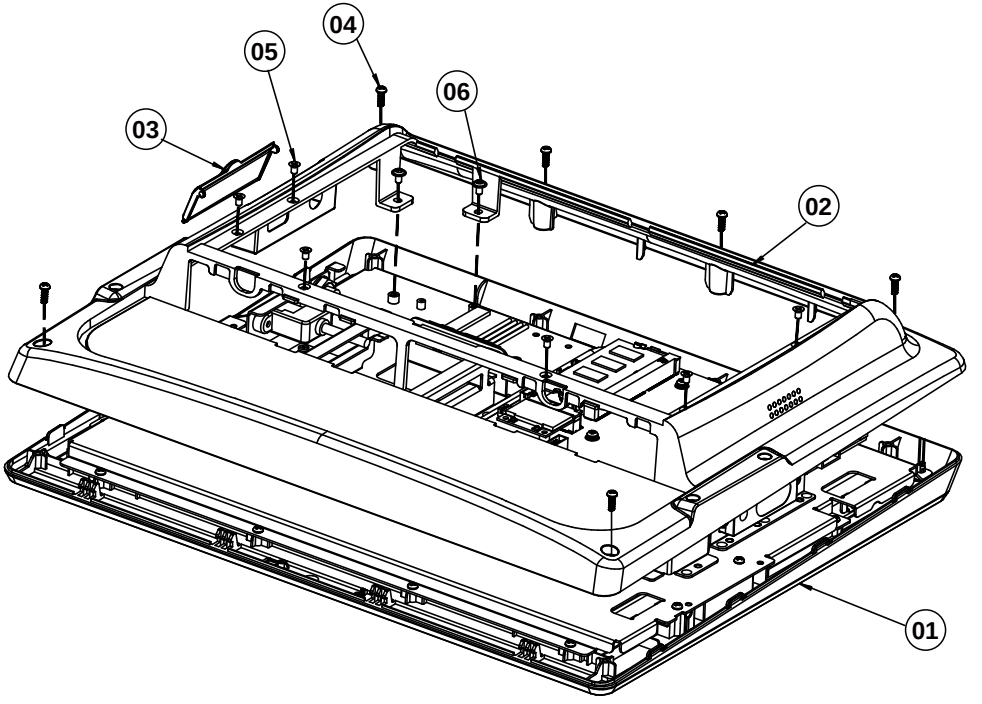
No.	Component Name	P/N No.	Q'ty
1	15" LCD panel (LED Backlight), 300nits, XGA (1024x768)	52-351-03150321	1
2	PA-5822 LCD Holder Module	20-029-03001407	1
3	PA-5822 LVDS Cable (30p to 20p) L=400mm	27-020-40708111	1
4	PA-5822 LED Backlight Cable (5p to 6p) L=420mm	27-055-40709111	1
5	LCD Poron Sponge (341.9x8x1mm)	90-013-24400000	4
6	PT-2070 Power Switch Cable L=400mm	27-019-33908071	1
7	PA-5822 1-Port USB Cable L=190mm	27-006-40704111	1
8	Thermal Interface Pads, K=4, 26x26x1.0mm (Blue)	81-006-82626002	1
9	PS-3100 LED Housing (Black)	30-014-04100165	1
10	PA-6922 Power LED Cable L=320mm(GREEN)	27-018-26906071	1
11	EVA_1	N/A	1
12	SATA HDD & Power Cable L=320mm+320mm	27-008-40707081	1
13	Fillister Head Screw #2 / M3x0.5Px6mm	82-275-30006018	2
14	Flat Head Screw #2 / UNC-No.4-40, L=8mm, FLAT=1.0mm	22-315-40008019	2
15	Round Head With Spring Washer Screw M3x0.5Px6mm	22-232-30060211	4

Motherboard Exploded Diagram (Capacitive Touch Screen)



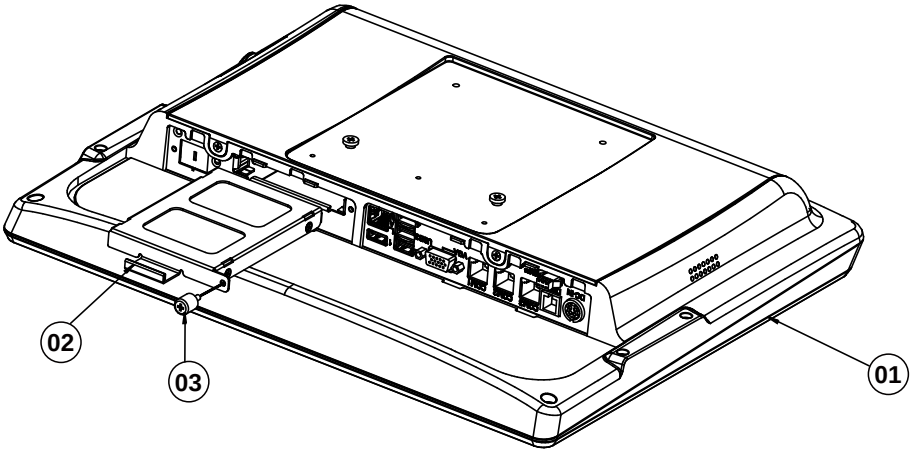
No.	Component Name	P/N No.	Q'ty
1	Front Cover Module	N/A	1
2	Panel Module	N/A	1
3	HSF, PA-6722 MB, for OBM, w/o reboot MCU, with external RTC	PB-6722RB-A1N	1
4	PA-5822 LED LENS(Transparency)	90-021-02130407	1
5	Double Tape	N/A	1
6	Lens EVA	N/A	1
7	PT-1470 Speaker Cable L=350mm	27-021-28307071	1
8	PA-6225 2ND-DIS Power Cable (3p to 3p) L=115mm	27-012-31403072	1
9	PA-5822 MSR PS/2 (i-BUT) Cable (2p to 2p) L=440mm	27-022-40709071	1
10	Fillister Head Screw #1 / M3x0.5Px3L, H=5mm	22-272-30008015	2
11	Round Head With Spring Washer Screw M3x0.5Px6mm	22-232-30060211	7
12	Pan Head Screw T3.0x6mm	22-132-30060011	14
13	HEX CU Boss No.4-40,L=4.8,H=7mm	22-692-40048051	2
14	Fillister Head Screw #2/M3x0.5Px4mm	82-272-30004018	2

Back Cover Exploded Diagram (Capacitive Touch Screen)

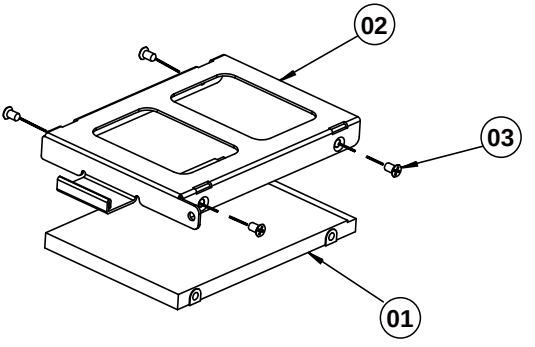


No.	Component Name	P/N No.	Q'ty
1	Front Cover Module	N/A	1
2	Rear Cover (Black)	30-002-28116407	1
	Rear Cover (NKC White)	30-002-28117407	1
3	USB Cover (Black)	30-002-28118407	1
	USB Cover (NKC White)	30-002-28119407	1
4	Pan Head Screw T3.0x8mm (Black)	22-122-30080011	6
5	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	6
6	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	2

Exploded Diagrams For Panel PC HDD Assembly (Capacitive Touch Screen)

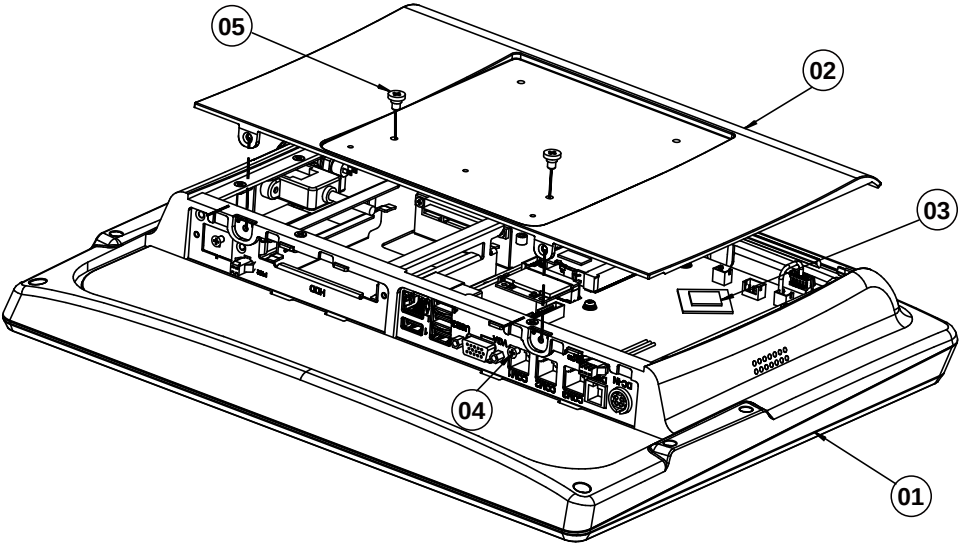


No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	HDD Module	N/A	1
3	Handle Head Screw M3x0.5Px7.7L, H=10mm	22-282-30008031	1



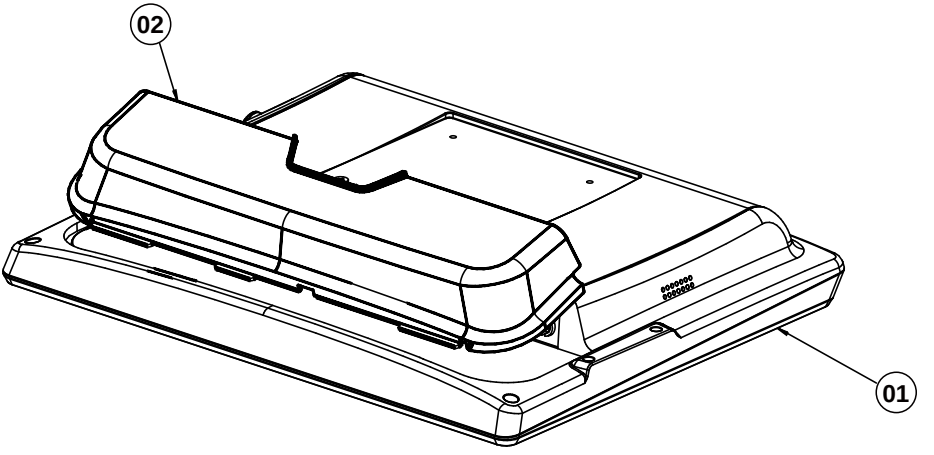
No.	Component Name	P/N No.	Q'ty
1	HDD	See Order	1
2	HDD Tray	80-054-03001407	1
3	Flat Head Screw #2 / M3x0.5Px4mm	22-215-30004311	4

AI Cover Exploded Diagram (Capacitive Touch Screen)



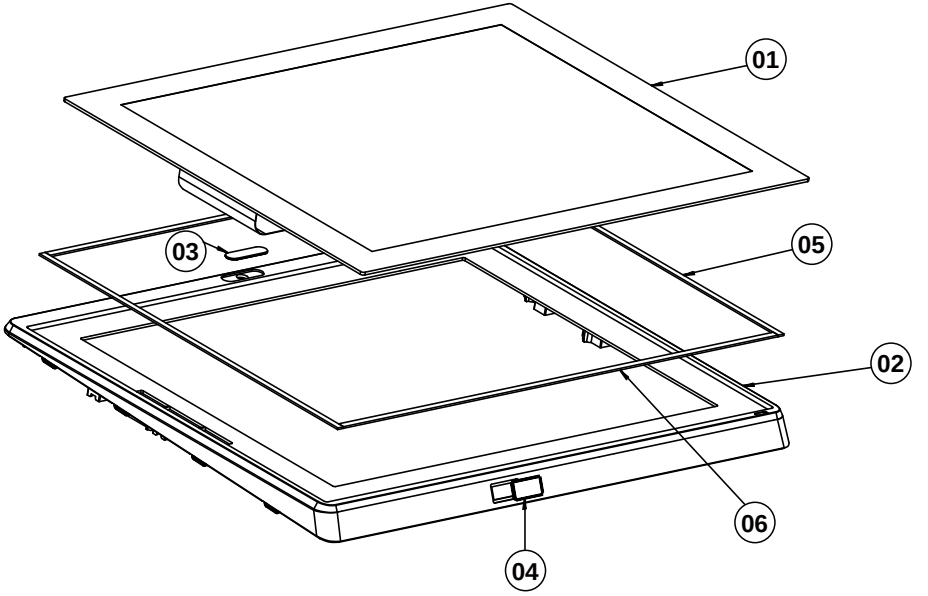
No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	AI Cover (Black)	20-004-02061407	1
	AI Cover (White)	20-004-01061407	1
3	Thermal Interface Pads, K=12, 18x18x1mm (Gray)	81-006-81818002	1
4	Flat Head Screw # 2 / M3x0.5Px5mm	22-215-30005011	2
	Flat Head Screw #2 / ϕ 5 /M3x0.5Px5mm	22-212-30005311	2
5	Fillister Head Screw M4x0.7Px4mm	22-272-40004911	2

I/O Cover Exploded Diagram (Capacitive Touch Screen)



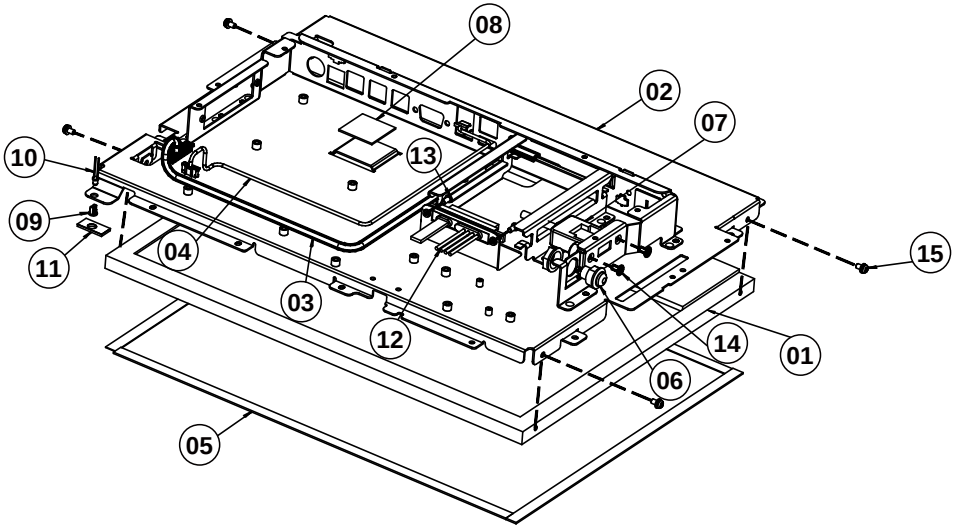
No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	IO Cover (Black)	30-002-28114407	1
	IO Cover (NKC White)	30-002-28115407	1

Front Cover Module Exploded Diagram (Resistive Touch Screen)



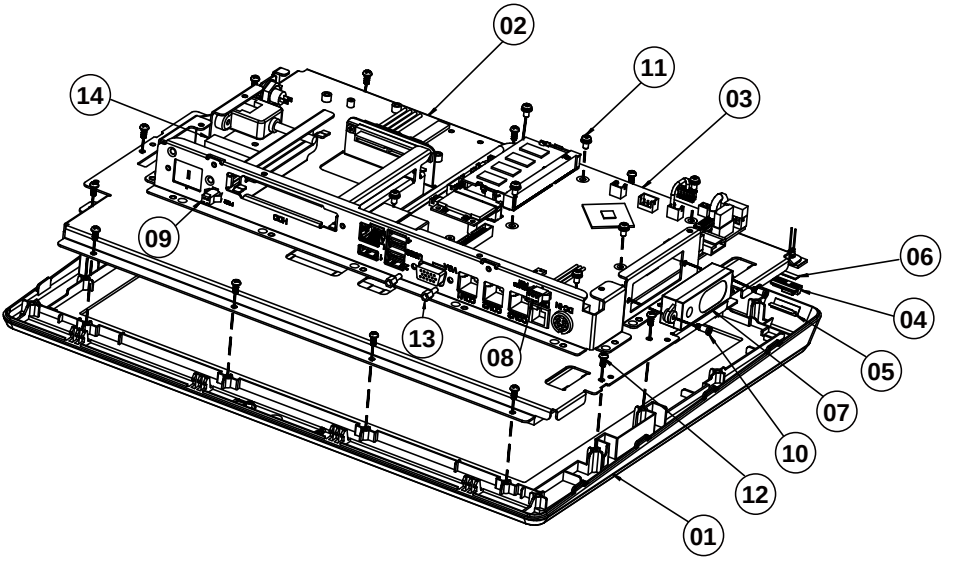
No.	Component Name	P/N No.	Q'ty
1	15" Resistive Touch Panel	52-380-00200114	1
	15" Flat Resistive Touch Panel	52-380-00114701	1
2	PA-5822 Front Cover (Black)	30-002-28112407	1
	PA-5822 Front Cover (NKC White)	30-002-28113407	1
3	Camera Lens (Black) (Opaque)	90-021-10150393	1
	Camera Lens (White) (Opaque)	90-021-10130393	1
4	Barcode Lens Black (Opaque)	30-021-10230378	1
	Barcode Lens White (Opaque)	90-021-10230407	1
5	Double Tape V	94-026-05002220	2
	Double Coated Tape B	94-026-04902220	2
6	Double Tape H	94-026-05001220	2
	Double Coated Tape A	94-026-04901220	2

Panel Module Exploded Diagram (Resistive Touch Screen)



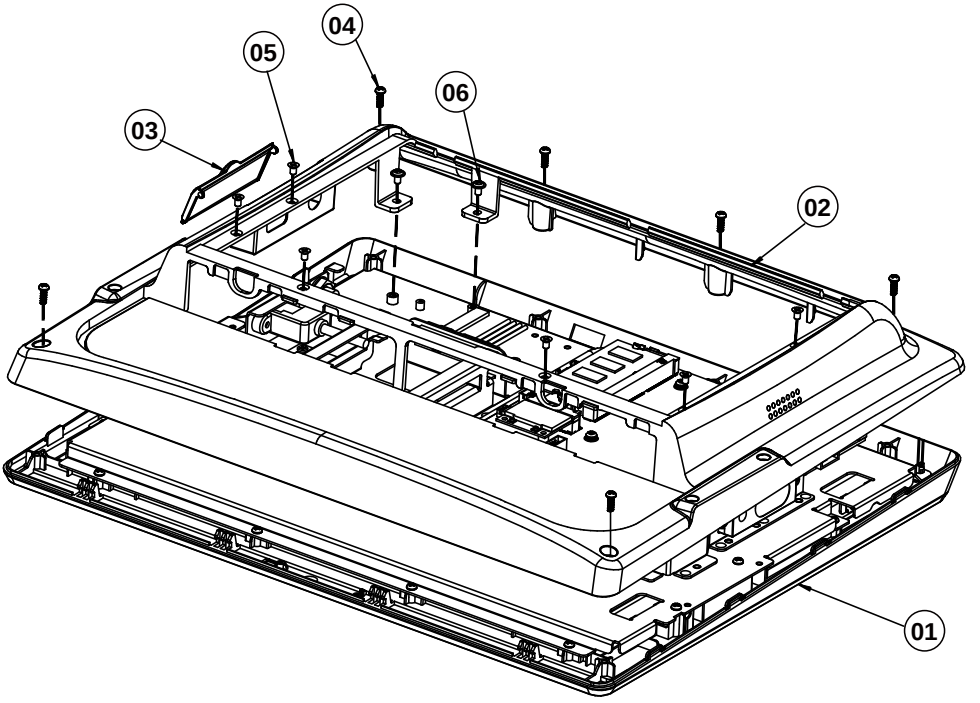
No.	Component Name	P/N No.	Q'ty
1	15" LCD panel (LED Backlight), 300nits, XGA (1024x768)	52-351-03150321	1
2	PA-5822 LCD Holder Module	20-029-03001407	1
3	PA-5822 LVDS Cable (30p to 20p) L=400mm	27-020-40708111	1
4	PA-5822 LED Backlight Cable (5p to 6p) L=420mm	27-055-40709111	1
5	LCD Poron Sponge (341.9x8x1mm)	90-013-24400000	4
6	PT-2070 Power Switch Cable L=400mm	27-019-33908071	1
7	PA-5822 1-Port USB Cable L=190mm	27-006-40704111	1
8	Thermal Interface Pads, K=4, 26x26x1.0mm (Blue)	81-006-82626002	1
9	PS-3100 LED Housing (Black)	30-014-04100165	1
10	PA-6922 Power LED Cable L=320mm(GREEN)	27-018-26906071	1
11	EVA_1	N/A	1
12	SATA HDD & Power Cable L=320mm+320mm	27-008-40707081	1
13	Fillister Head Screw #2 / M3x0.5Px6mm	82-275-30006018	2
14	Flat Head Screw #2 / UNC-No.4-40, L=8mm, FLAT=1.0mm	22-315-40008019	2
15	Round Head With Spring Washer Screw M3x0.5Px6mm	22-232-30060211	4

Motherboard Exploded Diagram (Resistive Touch Screen)



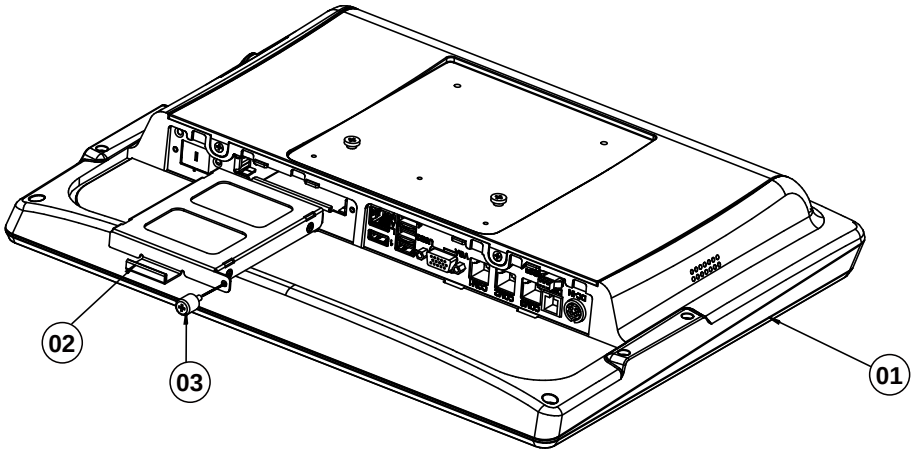
No.	Component Name	P/N No.	Q'ty
1	Front Cover Module	N/A	1
2	Panel Module	N/A	1
3	HSF, PA-6722 MB, for OBM, w/o reboot MCU, with external RTC	PB-6722RB-A1N	1
4	PA-5822 LED LENS(Transparency)	90-021-02130407	1
5	Double Tape	N/A	1
6	Lens EVA	N/A	1
7	PT-1470 Speaker Cable L=350mm	27-021-28307071	1
8	PA-6225 2ND-DIS Power Cable (3p to 3p) L=115mm	27-012-31403072	1
9	PA-5822 MSR PS/2 (i-BUT) Cable (2p to 2p) L=440mm	27-022-40709071	1
10	Fillister Head Screw #1 / M3x0.5Px3L, H=5mm	22-272-30008015	2
11	Round Head With Spring Washer Screw M3x0.5Px6mm	22-232-30060211	7
12	Pan Head Screw T3.0x6mm	22-132-30060011	14
13	HEX CU Boss No.4-40,L=4.8,H=7mm	22-692-40048051	2
14	Flat Cable Clamp	30-042-04100258	2

Back Cover Exploded Diagram (Resistive Touch Screen)

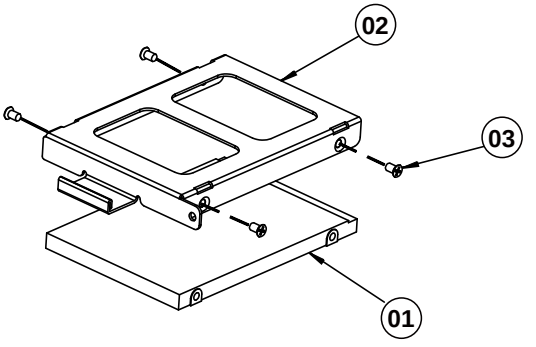


No.	Component Name	P/N No.	Q'ty
1	Front Cover Module	N/A	1
2	Rear Cover (Black)	30-002-28116407	1
	Rear Cover (NKC White)	30-002-28117407	1
3	USB Cover (Black)	30-002-28118407	1
	USB Cover (NKC White)	30-002-28119407	1
4	Pan Head Screw T3.0x8mm (Black)	22-122-30080011	6
5	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	6
6	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	2

Exploded Diagrams For Panel PC HDD Assembly (Resistive Touch Screen)

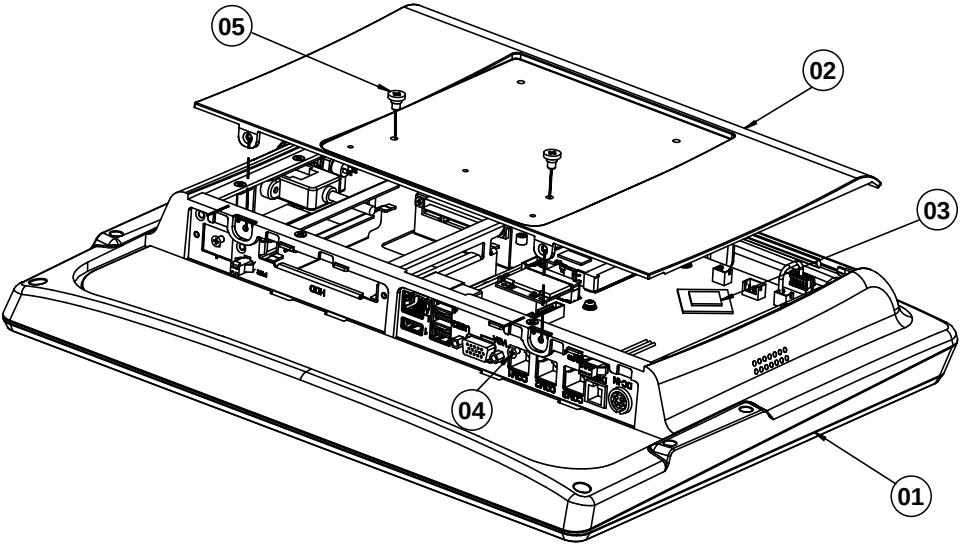


No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	HDD Module	N/A	1
3	Handle Head Screw M3x0.5Px7.7L, H=10mm	22-282-30008031	1



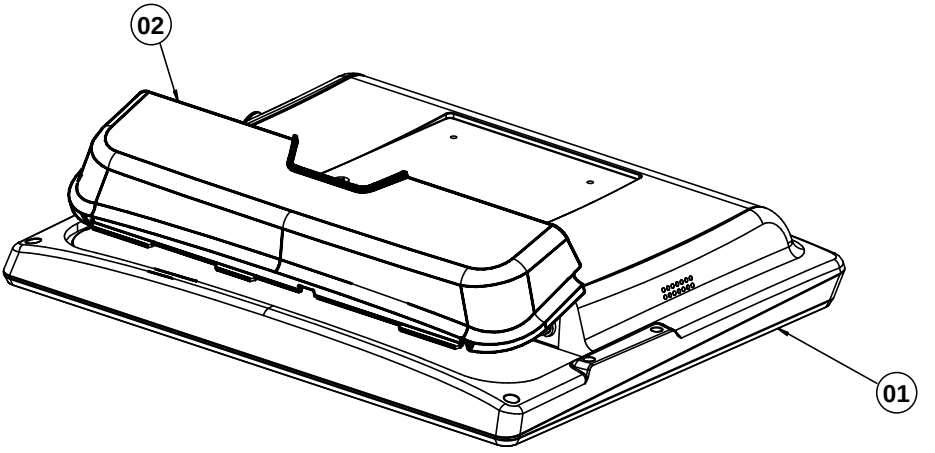
No.	Component Name	P/N No.	Q'ty
1	HDD	See Order	1
2	HDD Tray	80-054-03001407	1
3	Flat Head Screw #2 / M3x0.5Px4mm	22-215-30004311	4

AI Cover Exploded Diagram (Resistive Touch Screen)



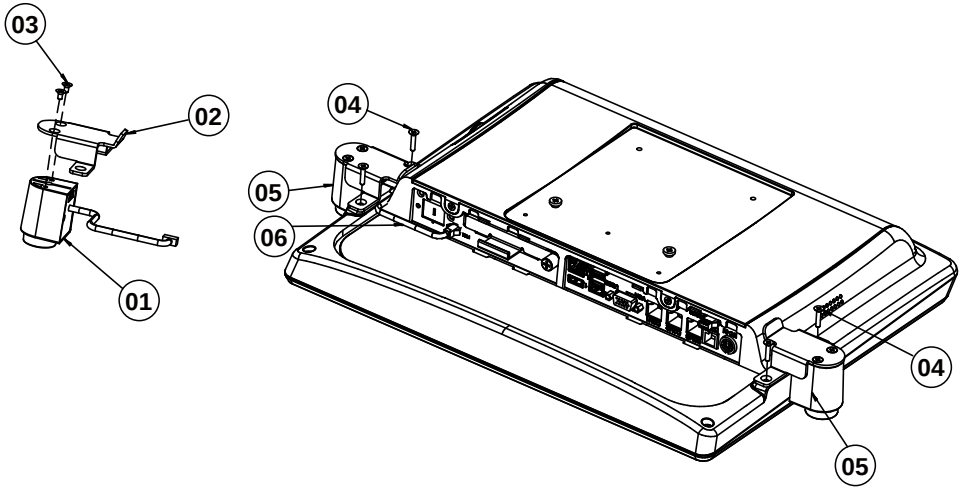
No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	AI Cover (Black)	20-004-02061407	1
	AI Cover (White)	20-004-01061407	1
3	Thermal Interface Pads, K=12, 18x18x1mm (Gray)	81-006-81818002	1
4	Flat Head Screw # 2 / M3x0.5Px5mm	22-215-30005011	2
	Flat Head Screw #2 / ϕ 5 /M3x0.5Px5mm	22-212-30005311	2
5	Fillister Head Screw M4x0.7Px4mm	22-272-40004911	2

I/O Cover Exploded Diagram (Resistive Touch Screen)



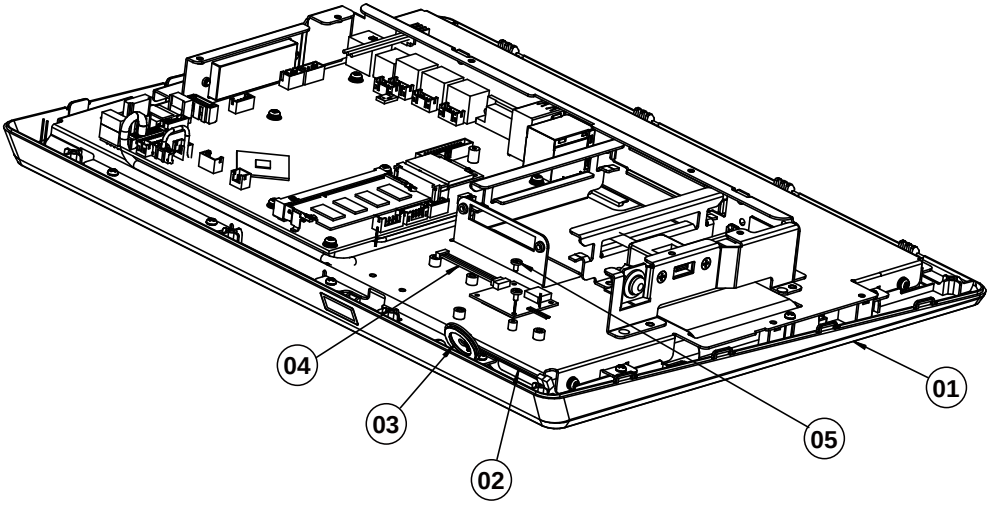
No.	Component Name	P/N No.	Q'ty
1	PA-5822 System	N/A	1
2	IO Cover (Black)	30-002-28114407	1
	IO Cover (NKC White)	30-002-28115407	1

I-Button Exploded Diagram



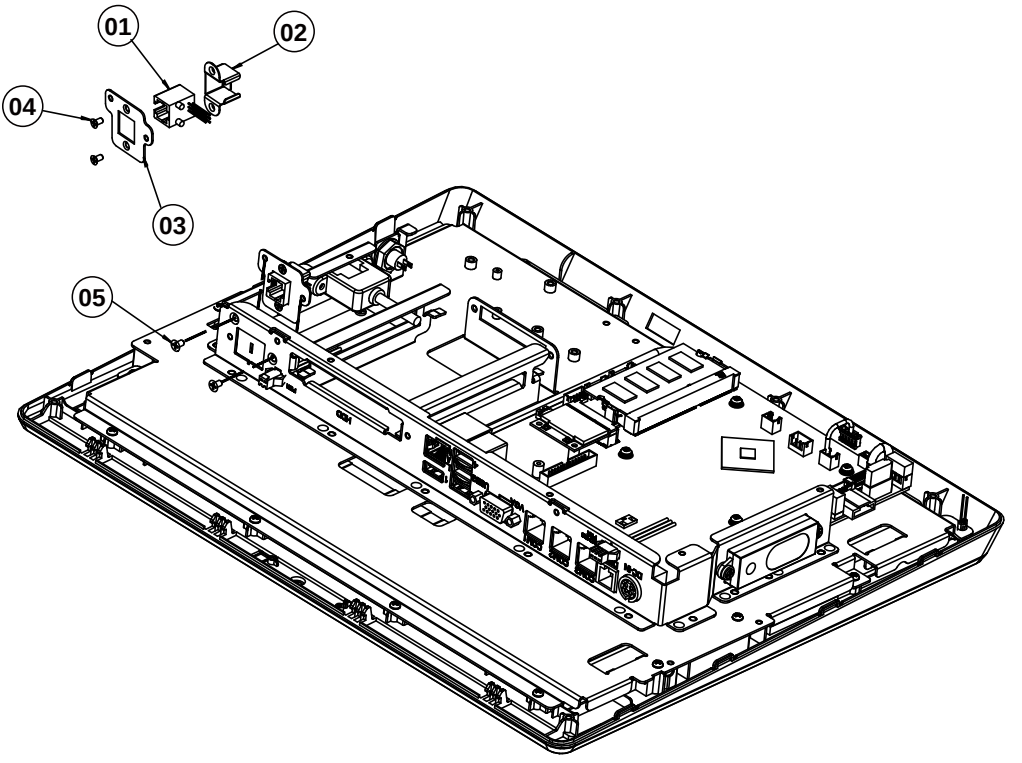
No.	Component Name	P/N No.	Q'ty
1	I_ Button Reader Module	52-551-05300102	1
2	I_ Button Bracket (w/Paint)(Black)	80-006-03061407	1
3	Flat Head Screw #2 / ϕ 5 /M3x0.5Px6mm (Black)	22-215-30006311	2
4	Flat Head Screw #2 / M3x0.5Px15mm	22-215-30015011	2
5	I_ Button Module	N/A	1
6	I_Button-PS/2(RJ11) Cable L=100mm	27-022-40702111	1
	I_Button-RS232(RJ45) Cable L=340mm	27-022-40707111	1
	I_ Button to USB (Type A) Cable L=270mm	27-006-40706112	1

RFID Module Exploded Diagram



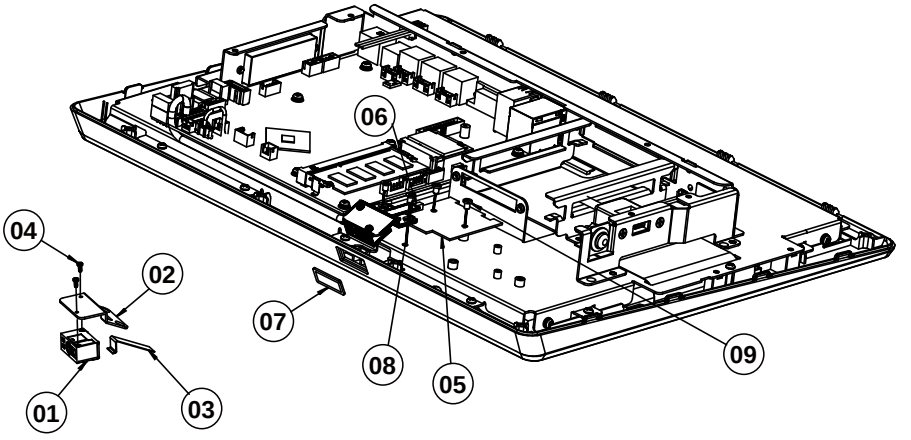
No.	Component Name	P/N No.	Q'ty
1	Front Cover Module	N/A	1
2	RFID Read/Write Module,RS232 interface	52-551-18032000	1
3	RFID Circle EVA (OD= φ 20mm,ID= φ 14mmx1.0T)	30-013-15100407	1
4	RFID Cable (8p to 10p)L=330mm	27-068-40707111	1
5	Round Head Screw M2x0.4Px4mm	22-232-20040011	2

RJ11 Cable Exploded Diagram



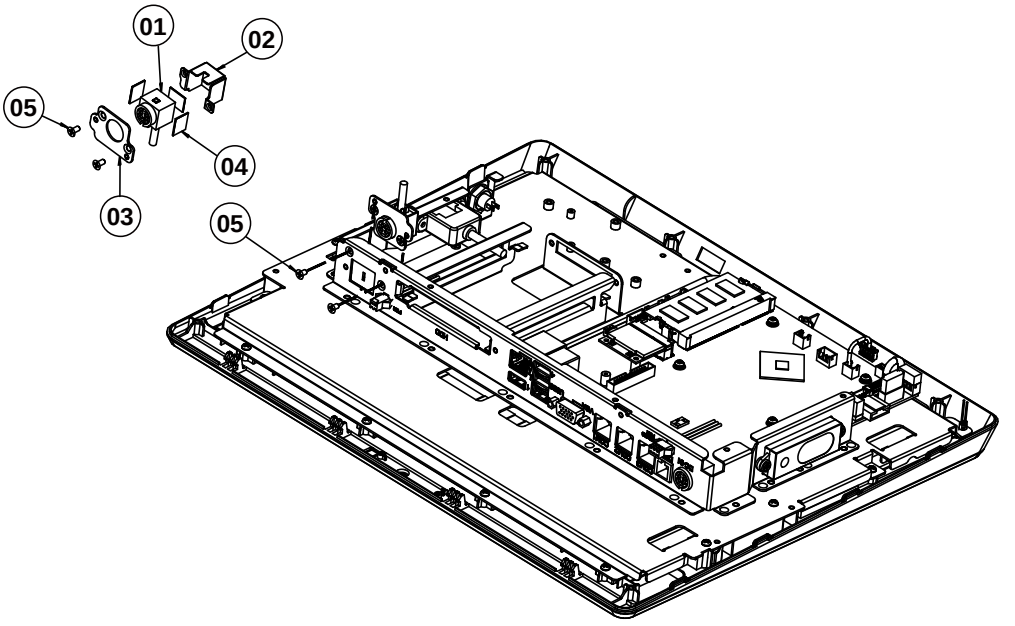
No.	Component Name	P/N No.	Q'ty
1	I_Button-PS/2(RJ11) Cable, L=225mm	27-014-40705111	1
2	RJ11 Holder	80-029-03002165	1
3	RJ11 Plate	80-005-03003407	1
4	Flat Head Screw #1/ M2.5x0.45Px4mm	22-215-25004011	2
5	Flat Head Screw #2 / ϕ 5 /M3x0.5Px5mm	22-212-30005311	2

Barcode Scanner Kit Exploded Diagram



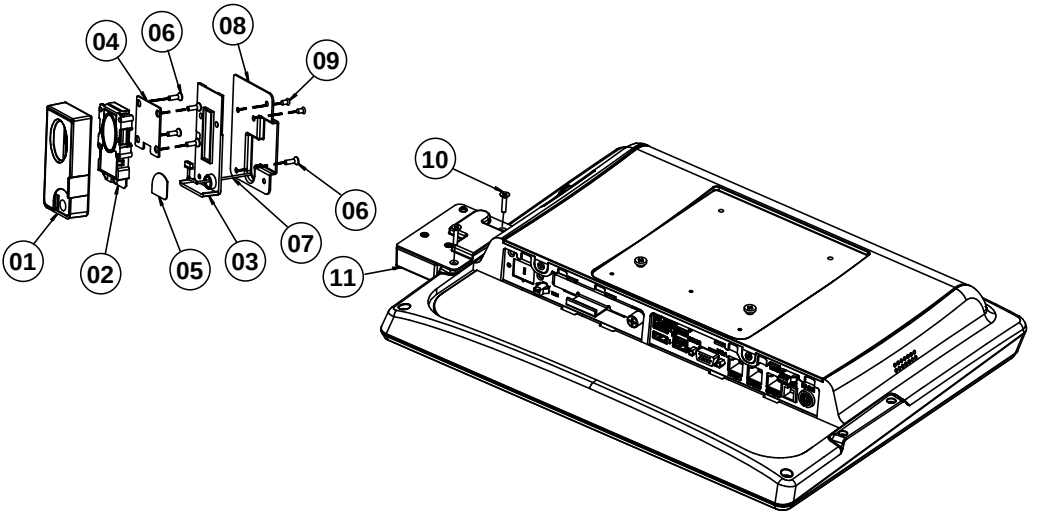
No.	Component Name	P/N No.	Q'ty
1	2D Barcode Scan Engine	52-820-32000107	1
2	PA-5822 Barcode Plate	80-005-03001407	1
3	MP-4815 FFC Cable Pitch=0.5mm Pin=12 L=95mm	27-000-39302091	1
4	PAN HEAD SCREW M1.6x0.35Px3mm	22-222-16003015	2
5	Connection board for AI3200 2D scan engine, USB HID interface	52-152-22052060	1
6	PA-5822 2D SCANNER CABLE(5p to 7p)L=140mm	27-055-40703111	1
7	MH-5100 Barcode LENS	30-021-10130378	1
8	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	2
9	Fillister Head Screw #2 / M3x0.5Px4mm	82-272-30004018	2

Print Power Cable Exploded Diagram



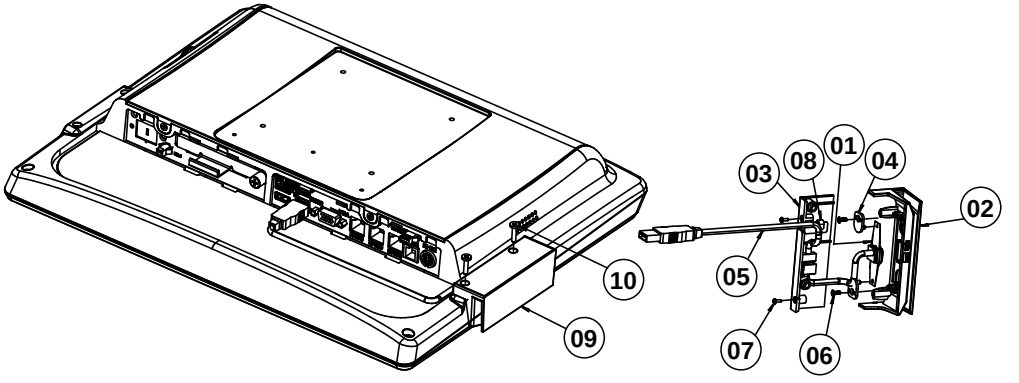
No.	Component Name	P/N No.	Q'ty
1	Print PWR Cable L=200mm	27-012-35304111	1
2	DC Jack Holder	80-029-03001407	1
3	DC Jack Plate	80-005-03002407	1
4	EVA Sponge (12x10x0.5mm)	90-013-15100314	3
5	Flat Head Screw #2 / ϕ 5/M3x0.5Px5mm	22-212-30005311	4

Fingerprint Module Exploded Diagram



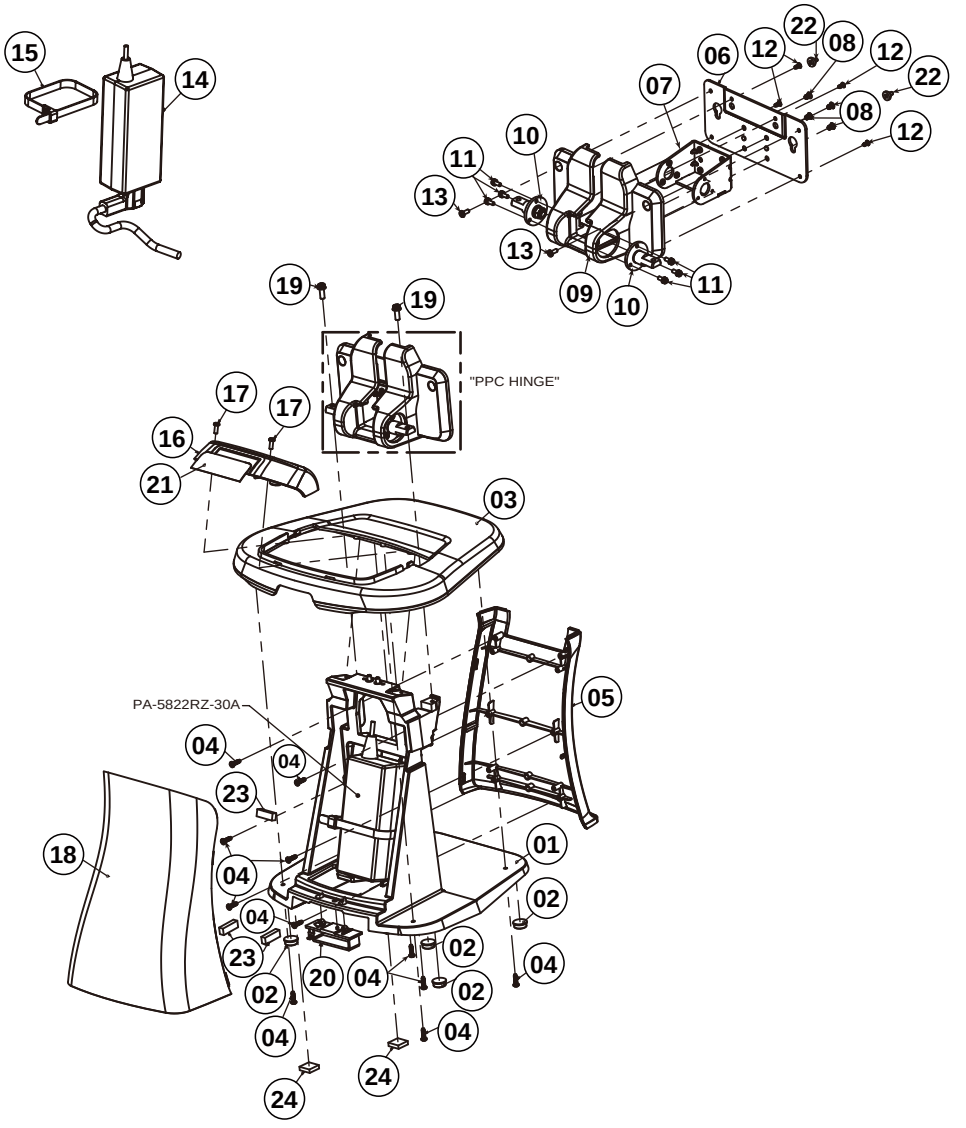
No.	Component Name	P/N No.	Q'ty
1	Fingerprint Top Cover-1 (w/Paint) (Black)	30-002-12720210	1
2	USB Fingerprint Reader Module, USB Interface (w/o cable)	52-551-00501205	1
3	Fingerprint BTM Cover (w/Paint) (Black)	30-002-12130210	1
4	Fingerprint Bracket	20-006-03007210	1
5	Fingerprint Hole Mylar (Black)	90-056-02100210	1
6	Flat Head Screw T3.0x10mm	22-712-30010011	5
7	Fingerprint Cable	N/A	1
8	Fingerprint Holder (w/Paint) (Black)	80-029-03061407	1
9	Flat Head Screw #2/ ϕ 5 / M3x0.5Px6mm (Black)	22-215-30006311	2
10	Flat Head Screw #2 / M3x0.5Px15mm	22-215-30015011	2
11	Fingerprint Module	N/A	1

MSR Module Exploded Diagram



No.	Component Name	P/N No.	Q'ty
1	Head & Spring For MSR Reader Module, USB Interface (w/300mm Cable)	52-551-02549210	1
	Head & Spring For MSR Reader Module, PS2 Interface (w/400mm Cable)	52-551-02539210	1
2	PA-5822 MSR Top Cover (Black)	30-002-28213407	1
	PA-5822 MSR Top Cover (White)	30-002-28214407	1
3	PA-5822 MSR Bottom Cover (Black)	30-002-28211407	1
	PA-5822 MSR Bottom Cover (White)	30-002-28212407	1
4	MSR Plate-pin_IDTECH	20-005-07001342	2
5	MSR USB Extend Cable L=260mm	27-006-40706111	1
6	Flat Head Screw #1/T2.6x6mm	22-112-26006011	2
7	Pan Head Screw #0 / M1.6x0.35Px5mm	22-222-16005011	2
8	Looking Cable Clamp	30-042-32100000	1
9	MSR Module	N/A	1
10	Fillister Head Screw #2 / M3x0.5Px10mm (Black)	22-275-30010018	2

Stand Exploded Diagram



No.	Component Name	P/N No.	Q'ty
1	PA-5822 Stand Support	20-002-01001407	1
2	PA-5822 Rubber Foot (Φ13x5mm) (Black)	90-004-01100407	4
3	PA-5822 Stand Base Cover (Black)	30-002-28210407	1
	PA-5822 Stand Base Cover (White)	30-002-28710407	1

4	Pan Head Screw #2 / T3.0x10mm (Black)	22-125-30010011	11
5	PA-5822 Stand Front Cover (Black)	30-002-28310407	1
	PA-5822 Stand Front Cover (White)	30-002-28810407	1
6	PA-5822 PPC Hinge Support-A	80-006-03002407	1
7	PA-5822 PPC Hinge Support-B	80-006-03003407	1
8	Flat Head Screw M4x0.7Px6mm (Black)	22-215-40006911	4
9	PA-5822 PPC Hinge Cover (Black)	30-002-28110407	1
	PA-5822 PPC Hinge Cover (White)	30-002-28610407	1
10	PA-5822 Hinge 40kgf-cm	20-012-29012407	2
11	Round Head with Spring Washer Screw M3x0.5Px8mm	22-232-30008211	6
12	Flat Head Screw #2 / T3.0x6mm	22-112-30006011	4
13	Fillister Head Screw #2 / M3x0.5Px8mm (Black)	22-275-30008018	2
	Fillister Head Screw #2 / M3x0.5Px8mm	22-272-30008018	2
14	60W AC to DC 24V/2.5A Power Adapter (w/Lock)	52-002-10068302	1
15	PA-5822 Cable Tie (250x7.5mm)	30-015-04100407	1
16	PA-5822 Stand Top Cover (Black)	30-002-28510407	1
	PA-5822 Stand Top Cover (White)	30-002-28111407	1
17	Pan Head Screw M3x0.5Px8mm	22-232-30008811	2
18	PA-5822 Stand Rear Cover (Black)	30-002-28410407	1
	PA-5822 Stand Rear Cover (White)	30-002-28910407	1
19	Round Head with Spring Washer Screw M4x0.7Px12mm	22-232-40012211	2
20	PA-5822 Wire Mount (Black)	90-042-04100407	1
21	PA-5822 Plate for("Prox" Logo)	94-017-02101407	1
22	Fillister Head Screw M4x0.7Px4mm	22-272-40004911	2
23	PA-5822 Rubber Foot (20x5x6.8) (Black)	30-004-01100407	3
24	Rubber Foot (13x13x4mm) (Black)	90-004-01101000	2