

USER MANUAL

PA-J600
21.5" Fanless Slim
POS Terminal

PA-J600 M2

PA-J600 21.5” Fanless Slim POS Terminal

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DISCLAIMER

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

CE NOTICE

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

FCC NOTICE

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

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



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



WARNING: Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.

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Revision History

The revision history of PA-J600 User Manual is described below:

Version No.	Revision History	Date
M1	Initial Release	2020/5/20
M2	<ul style="list-style-type: none">• The descriptions of Section 2.2 System Overview have been changed.• In Chapter 5 BIOS Setup, added the “RAID” option for SATA Mode Selection item in Section 5.1.3.2 Advanced – SATA Configuration.• Added Section 5.1.3.3 Advanced – Intel(R) Rapid Storage Technology.• In Appendix A System Diagram, added the easy maintenance diagrams: Removing PPC I/O Ports Covers and Adjusting Cable Covers Positions.	2020/07/30

1

Introduction

This chapter provides the introduction for PA-J600 system as well as the framework of the user manual.

The following topic is included:

- About This Manual

1.1 About This Manual

Thank you for purchasing our PA-J600 system. The PA-J600 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-J600 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 5 chapters and 2 appendixes. Users can configure the system according to their own needs. This user manual is intended for service personnel with strong hardware background. It is not intended for general users.

The following section describes the structure of this user manual.

Chapter 1 Introduction

This chapter introduces the framework of this user manual.

Chapter 2 Getting Started

This chapter describes the package contents and system specifications, and illustrates the physical appearances for PA-J600 system. Read the safety reminders carefully on how to take care of your system properly.

Chapter 3 System Configuration

This chapter describes the locations and functions of the system main board components. You will learn how to properly configure the connectors and system configuration jumpers on the main board and configure the system to meet your own needs.

Chapter 4 Software

This chapter introduces how to install Intel Chipset Software Installation Utility, Intel Management Engine Components Installer Driver Utility, Microsoft Hotfix Driver Utility, Graphics Driver Utility, LAN Driver Utility, Sound Driver Utility, Serial IO Driver Utility as well as API and API Function.

Chapter 5 AMI BIOS Setup

This chapter provides BIOS setup information.

Appendix A System Diagrams

This appendix provides the easy maintenance and exploded diagrams and part numbers of PA-J600.

Appendix B Technical Summary

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

2

Getting Started

This chapter provides the introduction for the PA-J600 system as well as the framework of the user manual.

The following topic is included:

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

Experienced users can jump to Chapter 3 on page 3-1 for a quick start.

2.1 Package List

If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

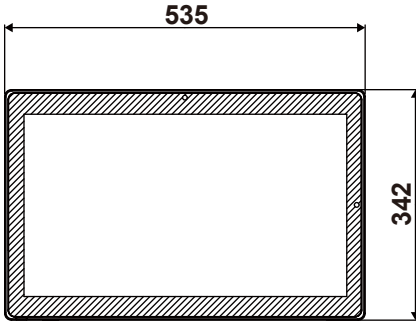
Item	Q'ty
PA-J600 POS System	1
Manual / Driver DVD	1

2.2 System Overview

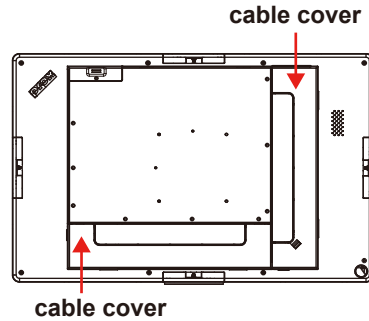
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2.2.1 Panel PC

Front View



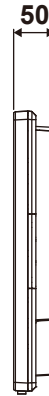
Rear View



Left Side View



Right Side View

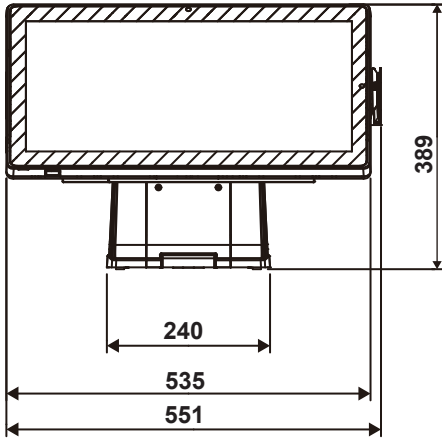


Note: If you want to change to view PPC vertically, refer to **Easy Maintenance of Appendix A** for cable wiring. See the description of **Screen Rotation Policy** setting of **Boot Menu** section of Chapter 5 BIOS Setup on how to view BIOS Setup Menu Initialization Screen vertically.

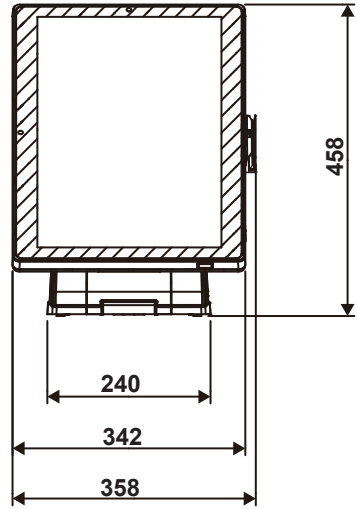
2.2.2 PA-J600 with Big Stand (without Priner)

Front View

Unit: mm

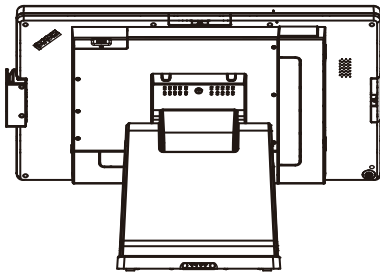


Touchscreen in Horizontal position

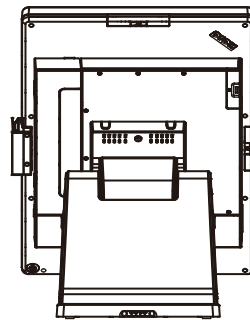


Touchscreen in Vertical position

Rear View



Touchscreen in Horizontal position

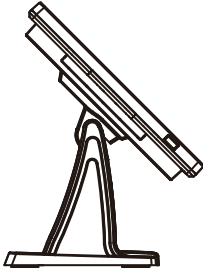


Touchscreen in Vertical position

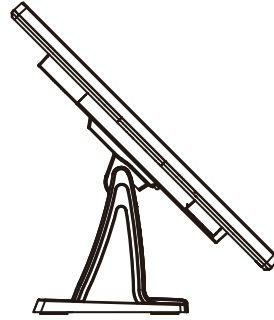
Note: If you want to change to view PPC vertically, refer to **Easy Maintenance of Appendix A** for cable wiring.
See the description of **Screen Rotation Policy** setting of **Boot Menu** section of Chapter 5 BIOS Setup on how to view BIOS Setup Menu Initialization Screen vertically.

Left Side View

Unit: mm

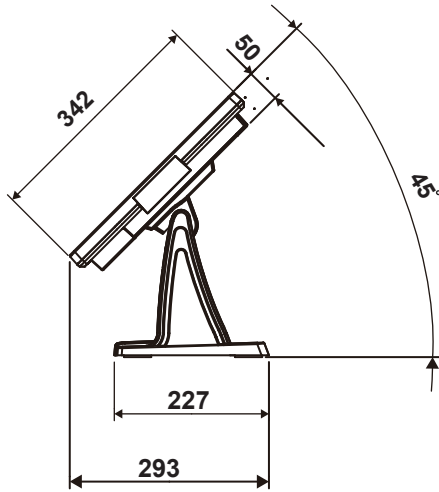


Touchscreen in Horizontal position



Touchscreen in Vertical position

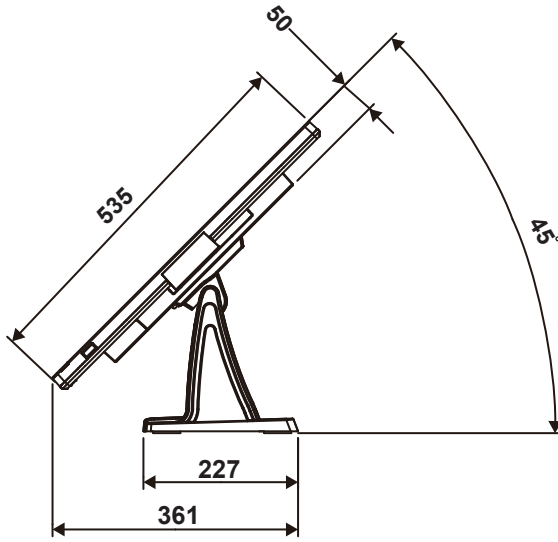
Right Side View



Touchscreen in Horizontal position

Right Side View

Unit: mm

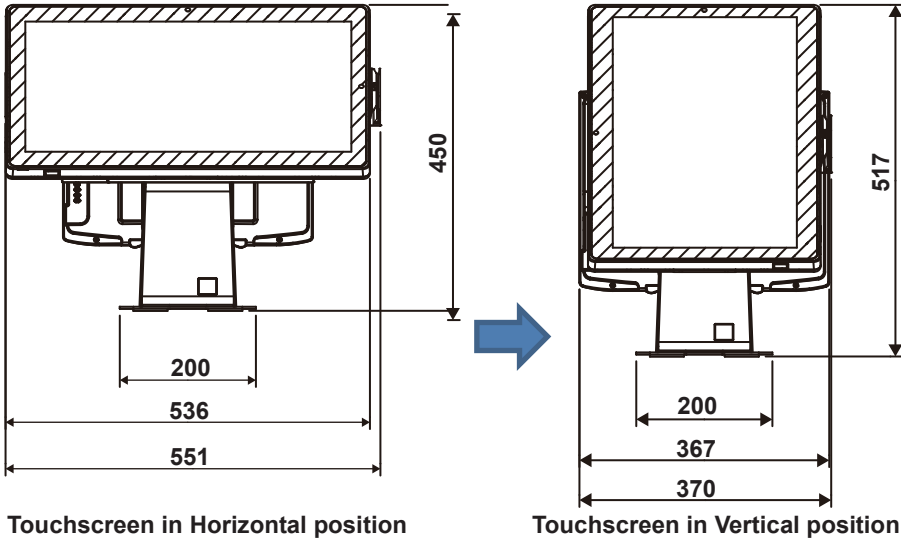


Touchscreen in Vertical position

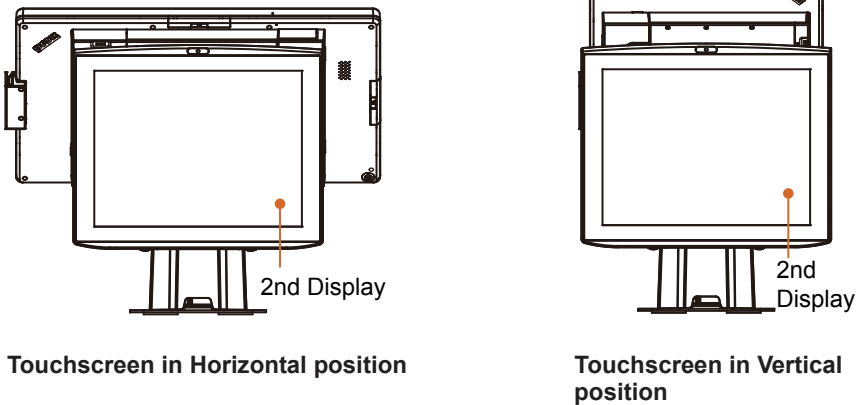
2.2.3 PA-J600 with PA-V560 Stand

Front View

Unit: mm



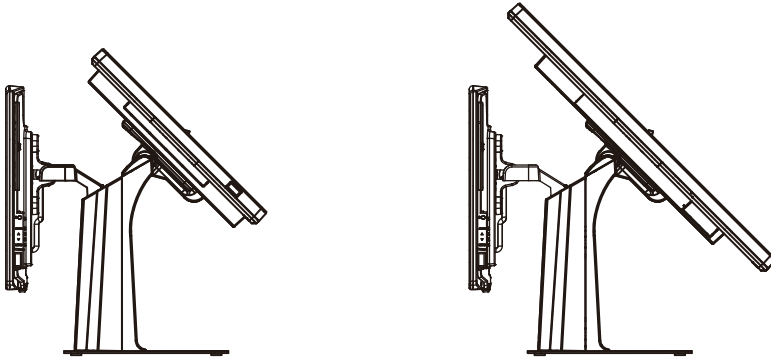
Rear View



Note: If you want to change to view PPC vertically, refer to **Easy Maintenance of Appendix A** for cable wiring. See the description of **Screen Rotation Policy** setting of **Boot Menu** section of Chapter 5 BIOS Setup on how to view BIOS Setup Menu Initialization Screen vertically.

Left Side View

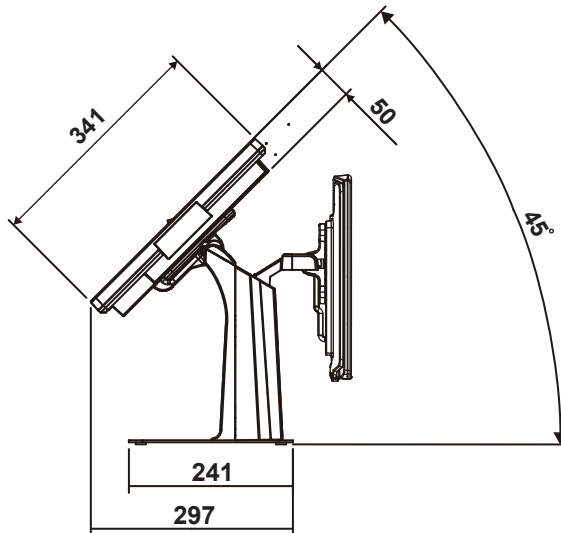
Unit: mm



Touchscreen in Horizontal position

Touchscreen in Vertical position

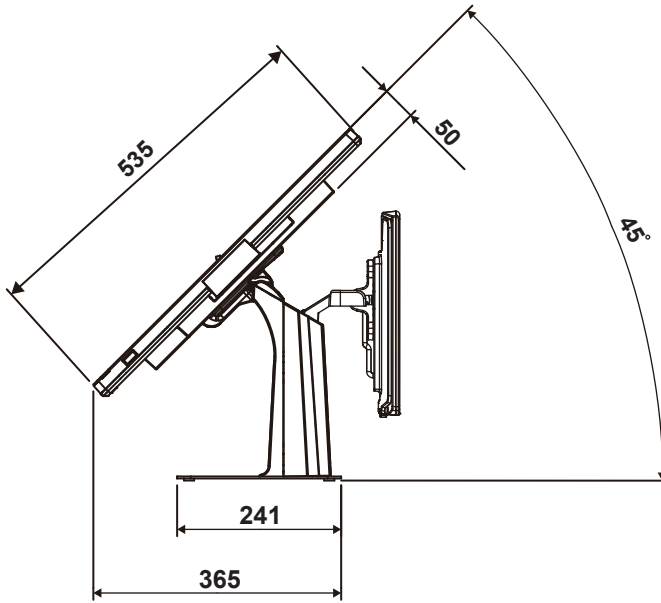
Right Side View



Touchscreen in Horizontal position

Right Side View

Unit: mm



Touchscreen in Vertical position

2.3 System Specifications

System	
CPU Supports	➤ Intel® Core™ i5-7300U / i3-7100U / Pentium® 4415U / Celeron® 3965U
Memory	➤ 1 x DDR4 SO-DIMM slot (up to 16GB)
Network	➤ 1 x Giga LAN (RJ45) for 10/100/1000 Mbps
Power Supply	➤ 90/120 Watt power adapter
Audio	➤ 2W speaker
System Weight	➤ 6.2kg (PPC)
Dimensions	➤ 535 x 342 x 50 mm (W x H x D)
O.S. Support	➤ Windows 10 IoT 2016 / 2019
Wall Mount Type	➤ VESA 100 x 100mm
Watchdog	➤ 1~255 seconds watchdog timer selectable
Other Slots	➤ 1 x M.2 2230 type for Wi-Fi module, Wi-Fi (PCIe) / BT(USB)
Storage	
SATA	➤ 1 x 2.5" HDD or SSD ➤ 1 x M.2 2242, SATA interface
I/O Ports	
USB	➤ 2 + 2 (optional) x USB 2.0 / 2 x USB 3.0 (Type A, rear I/O)
Serial Ports	➤ 1 x DB-9, 2+1 (optional) x RJ45 (all support +5V/+12V selectable)
LAN	➤ 1 x Giga LAN (RJ45) for 10/100/1000 Mbps
Cash Drawer	➤ 1 x RJ11, support 12V/24V selectable by Jumper
2nd & 3rd Display Support	➤ 1 x VGA D-Sub, 1080P@60Hz ➤ 1 x HDMI port, 4096 x 2304 @60Hz
Audio	➤ 1 x Mic In & Line Out (optional)
DC In	➤ 1 x 4-pin DC power jack, 24VDC In
Power Switch	➤ 1 x power switch
Add-ons	
Customer Display	➤ VFD kit, 20 columns and 2 lines, Resolution: 320 x 32 dots
MSR & iButton	➤ JIS I,II , ISO Track1+2+3

RFID	➤ ISO14443A read/write; ISO18092 read only
Fingerprint	➤ 8-bit grayscale reader
Camera	➤ 5.0M pixel CMOS camera module
Barcode Scanner	➤ 1D: EAN-13, EAN-8, UPC-A, UPC-E, ISSN, ISBN, Codabar, Code 128, Code 93, ITF-6, ITF-14, Interleaved 2 of 5, Industrial 2 of 5, Standard 2 of 5, Matrix 2 of 5, GS1 Databar, Code 39, Code 11 ➤ 2D: PDF417, QR Code, Micro QR, Data Matrix
Display	
LCD	➤ 21.5" TFT LCD (Resolution: 1920 x 1080) ➤ Brightness: 250 cd/m ²
Touchscreen	➤ Projected Capacitive touch panel, USB interface
Tilt Angle	➤ 0~50 degrees
Environment	
EMC & Safety	➤ CE / FCC
Operating Temp.	➤ 0°C ~ 35°C (32°F ~ 95°F)
Storage Temp.	➤ -20°C ~ 60°C (-4°F ~ 140°F)
Humidity	➤ 20% ~ 90%

2.4 Safety Precautions

Before operating this system, read the following information carefully to protect your systems 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-J600 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
 - Avoid installing your PA-J600 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-J600 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-J600 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 operating 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.

3

System Configuration

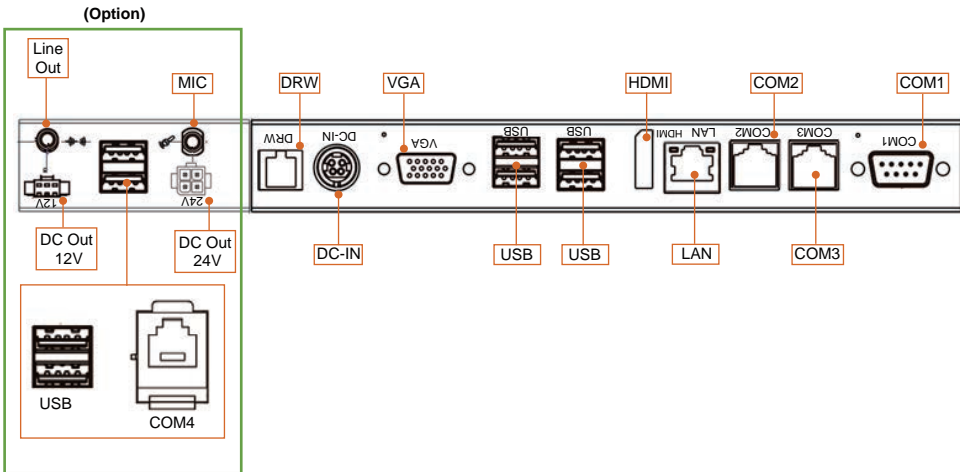
This chapter provides the information for the PA-J600 system. It describes the jumper and connector settings, component locations, and pin assignment.

The following topics are included:

- System External I/O Port Diagram
- Mainboard Component Locations & Jumper Setting
- How to Set Jumpers
- Setting Connectors and Jumpers

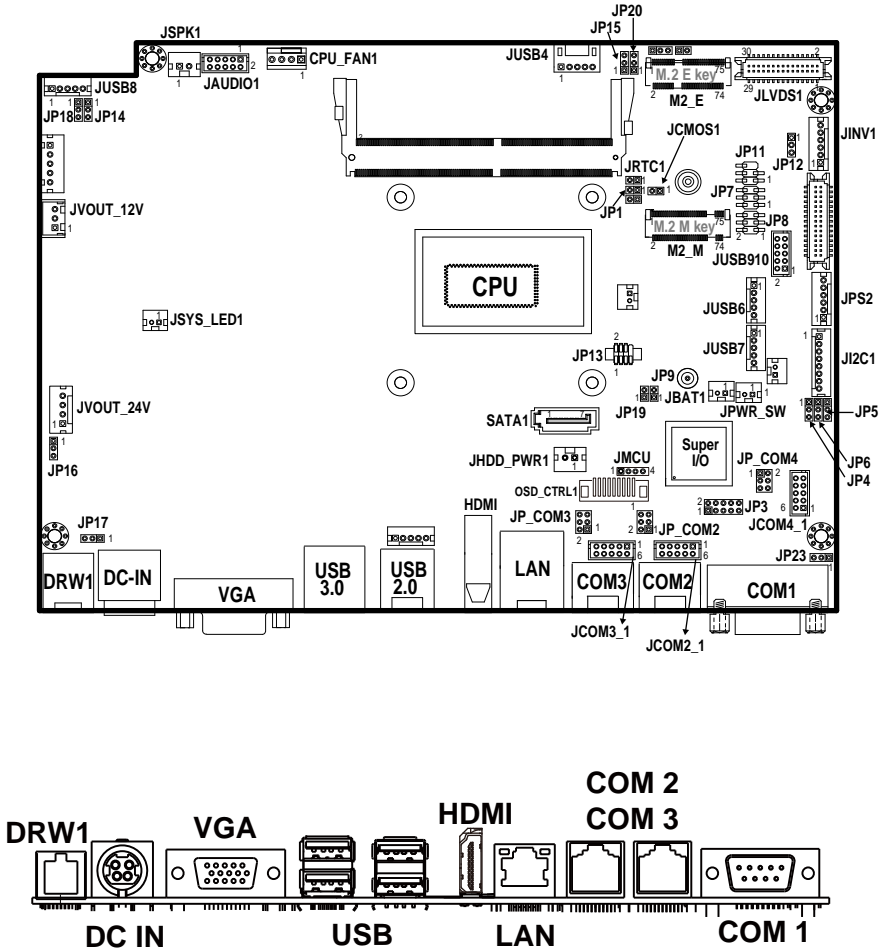
3.1 System External I/O Ports Diagram

Rear I/O



3.2 Mainboard Component Locations & Jumper Setting

M/B: PB-5685RC

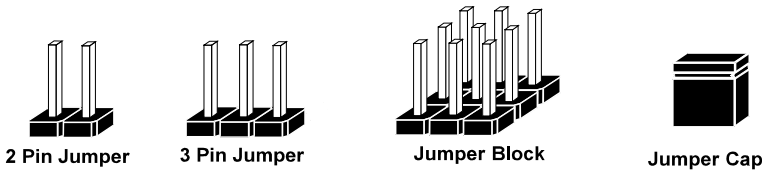


3.3 How to Set Jumpers

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

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

Jumpers & Caps

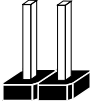


If a jumper has three pins, for example, labeled PIN1, PIN2 and PIN3. You can connect PIN1 and PIN2 to create one setting and shorting. You can also select to connect PIN2 and PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the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

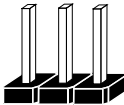
Jumper diagrams



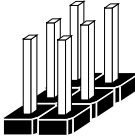
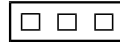
Jumper Cap looks like this



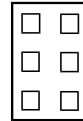
2 pin Jumper looks like this



3 pin Jumper looks like this



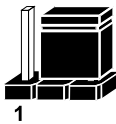
Jumper Block looks like this



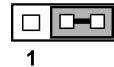
Jumper settings



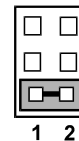
2 pin Jumper closed(enabled)
looks like this



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



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



3.4 Connector & Jumper Quick Reference Table

JUMPER / CONNECTOR	NAME
Power In Connector	DC_IN1
Power Out Wafer	JVOUT_12V, JVOUT_24V
COM Port RS-232 Connector	COM1, COM2_2, COM3_2
COM Port RS-232 Wafer	JCOM2_1, JCOM3_1, JCOM4_1
COM Port RI & Voltage Selection	JP_COM2, JP_COM3, JP_COM4
COM Port & i-Button Selection	JP4, JP5, JP6
COM Port Enable Selection	JP23
LAN Port Connector	LAN
USB 3.0 Port Type A Connector	USB1
USB 2.0 Port Type A Connector	USB2
USB 2.0 Port Wafer	JUSB4, JUSB6, JUSB7, JUSB8, JUSB910
USB8 and USB4 / M.2_E (Wi-Fi) Selection	JP18, JP14, JP20, JP15
VGA Connector	VGA
Cash Drawer Connector	DRW
Dual Cash Drawer Selection	JP17
Cash Drawer Voltage Selection	JP16
SATA Connector	SATA1
SATA Power Wafer	JHDD_PWR1
Clear CMOS Data Selection	JCMOS1
RTC Coin Battery Wafer	JBAT1
Clear RTC Data Selection	JRTC1
LVDS VCC Selection	JP11
Panel Inverter Wafer	JINV1
LVDS Resolution Selection	JP7, JP8
LVDS Backlight Control Selection	JP12

JUMPER / CONNECTOR	NAME
Speaker Wafer	JSPK1
Audio Codec Line Out/Mic Pin Header	JAUDIO1
Capacitive Touch Control Board Wafer	OSD_CTRL1
Flash MCU Firmware Wafer	JMCU
LVDS Wafer	JLVDS1
HDMI Connector	HDMI
Power Button Wafer	JPWR_SW
System Reset Wafer	JP19
System LED Wafer	JSYS_LED1
I2C Wafer	JI2C1
PS2 Wafer	JPS2
CPU FAN Wafer (PA-J600 is a fanless system)	CPU_FAN1
Flash Descriptor Security Override	JP1
SPI (BIOS) Flash Wafer	JP13
M.2 M-Key Connector for SSD	M2_M
M.2 E-Key Connector for Wi-Fi	M2_E

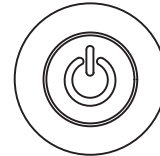
3.5 Setting Connectors and Jumpers

3.5.1 Power Switch

Connector Location: Power Switch

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

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V



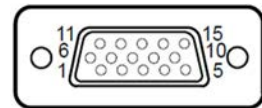
Power Switch

3.5.2 VGA Port (VGA)

Connector Location: VGA

Description: VGA Port, D-Sub 15-pin

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	-	-



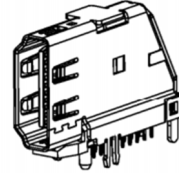
VGA

3.5.3 HDMI Port (HDMI)

Connector Location: HDMI

Description: HDMI Port.

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDMI_P2	2	GND
3	HDMI_N2	4	HDMI_P1
5	GND	6	HDMI_N1
7	HDMI_P0	8	GND
9	HDMI_N0	10	HDMI_CLKP
11	GND	12	HDMI_CLKN
13	X	14	X
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	VCC5_HDMI
19	HDMI_HPD	G1	GND
G2	GND	G3	-
G4	GND	-	-



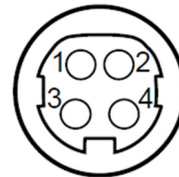
HDMI

3.5.4 PWR IN Connector

Connector Location: DC IN

Description: Power IN Connector

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



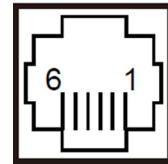
DC IN

3.5.5 Cash Drawer Port (DRW)

Connector Location: DRW

Description: DRW is used by default. If you need a second port, adopt the method below:

PIN	ASSIGNMENT
1	GPIO2 /DRW2
2	GPIO1 /DRW1
3	DRW1 Sense
4	+12V / 24V(Source)
5	DRW2 Sense
6	GND



DRW

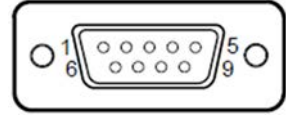
Please refer to DRW port for details.

3.5.6 COM Port (COM1)

Connector Location: COM1

Description: COM Port, D-sub 9-pin

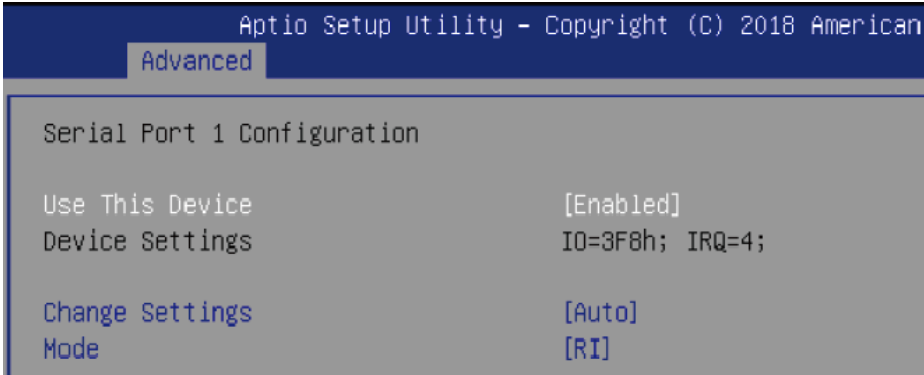
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCDJ_I	6	DSRJ_I
2	RX_I	7	RTSJ_I
3	TX_I	8	CTSJ_I
4	DTRJ_I	9	RI_SEL
5	GND	-	NC



COM1

COM1 Voltage Adjustment

Voltage of external port "COM1" is made to control on BIOS for your convenience.

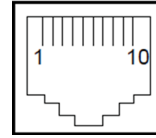


3.5.7 COM Ports (COM2, COM3, COM4)

Connector Location: COM2, COM3, COM4

Description: COM Ports, RJ45

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCDJ_I	6	DSRJ_I
2	RX_I	7	RTSJ_I
3	TX_I	8	CTSJ_I
4	DTRJ_I	9	RI_SEL
5	GND	10	NC



**COM2 /
COM3 /
COM4 (option)**

3.5.8 COM2, COM3, COM4 Voltage Selection (JP_COM2, JP_COM3, JP_COM4)

Connector Location: JP_COM2, JP_COM3, JP_COM4

Description: COM2, COM3 and COM4 voltage are set by jumpers on board.

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
RI	1-2	<p>JP_COM2 JP_COM3</p>	<p>JP_COM4</p>
+12V	3-4	<p>JP_COM2 JP_COM3</p>	<p>JP_COM4</p>
+5V	5-6	<p>JP_COM2 JP_COM3</p>	<p>JP_COM4</p>

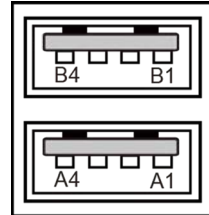
3.5.9 Dual USB 2.0 Ports (USB2)

Connector Location: USB2

Description: USB 2.0 Type A Ports

USB2.0

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+5VSB	5	+5VSB
2	USB2_P3_DN	6	USB2_P5_DN
3	USB2_P3_DP	7	USB2_P5_DP
4	GND	8	GND
G1	GND	G3	GND
G2	GND	G4	GND



USB2
(USB2.0)

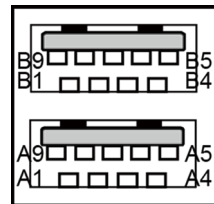
3.5.10 Dual USB 3.0 Ports (USB1)

Connector Location: USB1

Description: USB 3.0 Type A Ports

USB3.0

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	+5VSB	B1	+5VSB
A2	USB2_P1_DN	B2	USB2_P2_DN
A3	USB2_P1_DP	B3	USB2_P2_DP
A4	GND	B4	GND
A5	USB3_P1_BP_RX_DN	B5	USB3_P2_BP_RX_DN
A6	USB3_P1_BP_RX_DP	B6	USB3_P2_BP_RX_DP
A7	GND	B7	GND
A8	USB3_P1_BP_TX_DN	B8	USB3_P2_BP_TX_DN
A9	USB3_P1_BP_TX_DP	B9	USB3_P2_BP_TX_DP
G1	GND	G3	GND
G2	GND	G4	GND



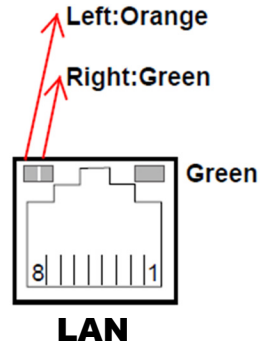
USB1
(USB3.0)

3.5.11 LAN Port (LAN)

Connector Location: LAN

Description: LAN Port, RJ45

PIN	ASSIGNMENT
1	LAN1_MDIO_DP
2	LAN1_MDIO_DN
3	LAN1_MDII_DP
4	LAN1_MDII_DN
5	CT
6	CT
7	LAN1_MDII2_DP
8	LAN1_MDII2_DN
9	LAN1_MDII3_DP
10	LAN1_MDII3_DN



LAN LED Indicator:

Left Side LED

Orange Color Blinking	Giga LAN Message Active
Green Color Blinking	10/100Mbps LAN Message Active

Right Side LED

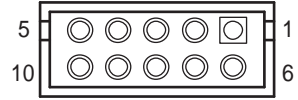
Green Color On	LAN switch / hub connected.
----------------	-----------------------------

3.5.12 COM Connectors (JCOM2_1, JCOM3_1, JCOM4_1)

Connector Location: JCOM2_1, JCOM3_1, JCOM4_1

Description: COM Connectors

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCDJ_I	6	DSRJ_I
2	RX_I	7	RTSJ_I
3	TX_I	8	CTSJ_I
4	DTRJ_I	9	RI_SEL
5	GND	10	NC



JCOM2_1 /
JCOM3_1 /
JCOM4_1

3.5.13 COM4 Port and iButton Selection (JP4, JP5, JP6)

Jumper Location: JP4, JP5, JP6



Description: COM4 Port and iButton Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM4 Enable	1-2 <i>(Default Setting)</i>	<p>JP4 / JP5 / JP6</p>
I-BUTTON	2-3	<p>JP4 / JP5 / JP6</p>

3.5.14 Enable COM4 Port Selection (JP23)

Jumper Location: JP23

Description: Enable COM4 Port selection

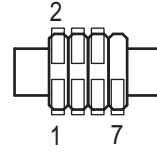
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM4 Disable	1-2	 JP23
COM4 Enable	2-3 <i>(Default Setting)</i>	 JP23

3.5.15 SPI(BIOS) Flash Wafer (JP13)

Connector Location: JP13

Description: SPI(BIOS) Flash Wafer

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+3.3VSB	2	GND
3	SPI_CS0_N	4	SPI_CLK
5	SPI_CS0_N	6	SPI_MOSI
7	SPI_MISO	8	NC



JP13

3.5.16 Audio Jack (Line Out, Mic)

Connector Location: Line Out, Microphone

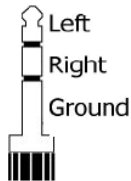
Description: Audio Jack

Line Out



Phone Jack 3.5 apply to

Connector as:

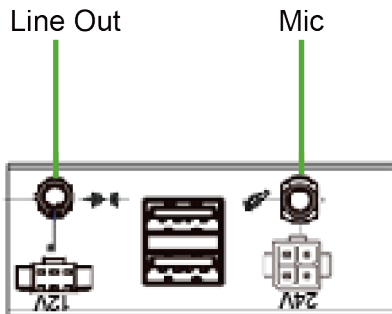
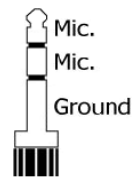


Microphone



Phone Jack 3.5 apply to

Connector as:



3.5.17 Drawer Ports (DRW1, DRW1-1, DRW1-2)

Connector Location: DRW1, DRW1-1, DRW1-2

Description: DRW1 is used by default. If you need a second port, adopt either way below.



Step1: DRW1 includes two groups of GPIO pins. The second group is normally unused but can be enabled by the jumper. Set the pin-header jumper JP17 as 1-2 connected if necessary.

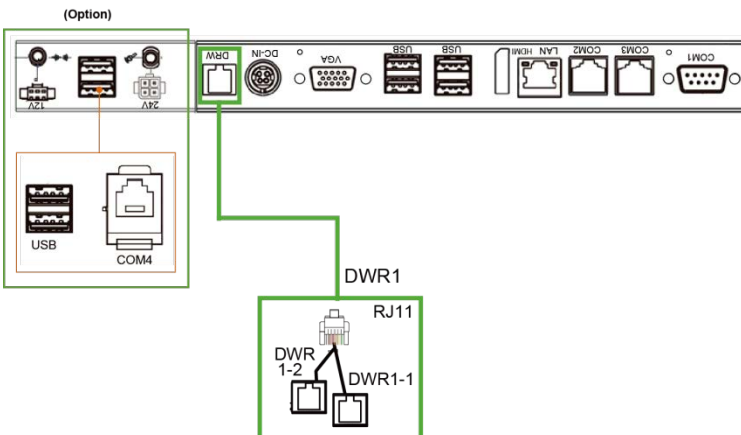
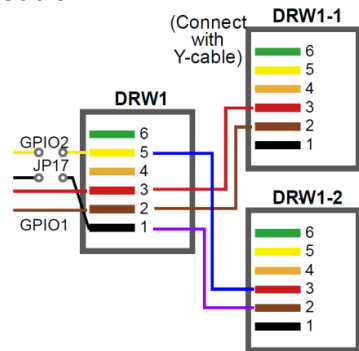
Step2: You can split DRW1 into two channels of DRW1-1 & DRW1-2 with the Y-Cable (option).

3.5.18 Dual Cash Drawer with Y-Cable (JP17)

Jumper Location: JP17

Description: Dual Cash Drawer Selection with Y-Cable

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
DRW1-1 & DRW1-2	1-2	 JP17
DRW1 only	2-3 <i>(Default Setting)</i>	 JP17





Step3: DRW1, DRW1-1, DRW1-2 shares the same power source.

3.5.19 Cash Drawer Voltage Selection (JP16)

Jumper Location: JP16

Description: Cash Drawer Voltage Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
24V	1-2 <i>(Default Setting)</i>	 <p>JP16</p>
12V	2-3	 <p>JP16</p>

SIO Address	
Cash 1	0xA02 bit5
Status 1	0xA02 bit43
Cash 2	0xA02 bit7
Status 2	0xA02 bit6

Cash Drawer Configuration

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

Configuration Sequence

To program [F81866](#) configuration registers, the following configuration sequence must be followed:

- (1) Enter the extended function mode
- (2) Configure the configuration registers
- (3) Exit the extended function mode

(1) Enter the extended function mode

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

(2) Configure the configuration registers

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

(3) Exit the extended function mode

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

Code example for open the cash drawer 1

```
;----- Enter to extended function mode -----  
mov     dx,      2eh  
mov     al,      87h  
out     dx,      al  
out     dx,      al  
;----- Select Logical Device 6 of Cash drawer -----  
Mov     al,      07h  
out     dx,      al  
inc     dx  
mov     al,      06h  
out     dx,      al  
dec     dx  
;----- Open the Cash drawer 1 -----  
Mov     al,      89h  
out     dx,      al  
inc     dx  
mov     al,      0DFh  
out     dx,      al  
;----- Exit the extended function mode -----  
dec     dx  
mov     al,      0aah  
out     dx,      al
```

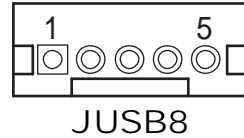
3.5.20 USB Connectors (JUSB4, JUSB6, JUSB7, JUSB8, JUSB910)

Connector Location: JUSB4, JUSB6, JUSB7, JUSB8, JUSB910

Description: JUSB4 signal is shared from "M.2_E" port, and could be functioned when JP15 is set 2-3, JP20 is set 2-3[short].

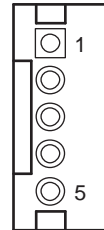
JUSB8

PIN	ASSIGNMENT
1	VCC5
2	USB8_N
3	USB8_P
4	GND
5	GND



JUSB6

PIN	ASSIGNMENT
1	+5VSB
2	USB2_P6_DN
3	USB2_P6_DP
4	GND
5	GND

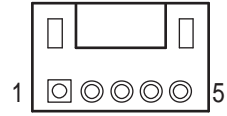


JUSB7

PIN	ASSIGNMENT
1	+5VSB
2	USB2_P7_DN
3	USB2_P7_DP
4	GND
5	GND

JUSB4

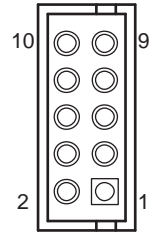
PIN	ASSIGNMENT
1	VCC5
2	4N
3	4P
4	GND
5	GND



JUSB4

JUSB910

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+5VSB	2	+5VSB
3	USB2_P9_DN	4	USB2_P10_DN
5	USB2_P9_DP	6	USB2_P10_DP
7	GND	8	GND
9	NC	10	GND

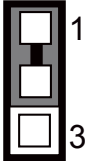
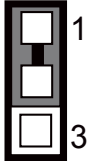


JUSB910

3.5.21 USB8 and USB4 / M.2_E (Wi-Fi) Selection (JP18, JP14, JP20, JP15)

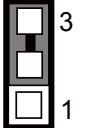
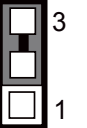
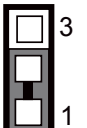
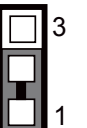
Jumper Location: JP18, JP14

Description: USB 2.0

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
JUSB8	1-2	 <p>JP18</p>	 <p>JP14</p>

Jumper Location: JP20, JP15

Description: USB4 / M.2_E (Wi-Fi) Selection

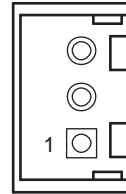
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
JUSB4	2-3	 <p>JP20</p>	 <p>JP15</p>
M.2_E (Wi-Fi)	1-2 <i>(Default Setting)</i>	 <p>JP20</p>	 <p>JP15</p>

3.5.22 Power for 2nd Display Connector (JVOUT_12V)

Connector Location: JVOUT_12V

Description: Power for 2nd Display Connector

PIN	ASSIGNMENT
1	VCC12
2	GND
3	VCC12



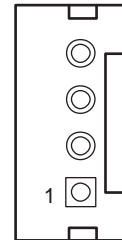
JVOUT_12V

3.5.23 Power for Thermal Printer Connector (JVOUT_24V)

Connector Location: JVOUT_24V

Description: Power for Thermal Printer Connector

PIN	ASSIGNMENT
1	VCC24
2	VCC24
3	GND
4	GND



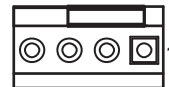
JVOUT_24V

3.5.24 Fan Connector (CPU_FAN1)

Connector Location: CPU_FAN1

Description: Fan Connector

PIN	ASSIGNMENT
1	GND
2	VCC12
3	CPU_FANOUT
4	CPU_FANIN



CPU_FAN1

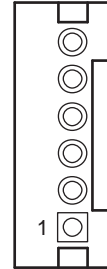
Note: PA-J600 is a fanless system.

3.5.25 PS/2 Keyboard function for MSR Device (JPS2)

Connector Location: JPS2

Description: PS/2 Keyboard function for MSR device

PIN	ASSIGNMENT
1	GND
2	+5VSB
3	Key_Data
4	Key_Data
5	Key_Clk



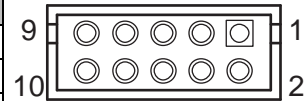
JPS2

3.5.26 Audio Connector (JAUDIO1)

Connector Location: JAUDIO1

Description: Audio Codec Line Out / Mic Pin Header

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MIC1-L	2	MIC1-R
3	HD_GND	4	SLP_S3_N
5	Jack_Sense	6	DC_VOL_MCU_OUT
7	HD_GND	8	HD_GND
9	LINE-OUT-L	10	LINE-OUT-R



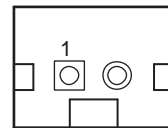
JAUDIO1

3.5.27 Speaker Connector (JSPK1)

Connector Location: JSPK1

Description: Speaker Connector

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



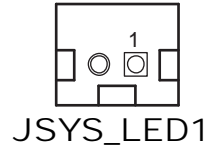
JSPK1

3.5.28 System LED Wafer (JSYS_LED1)

Connector Location: JSYS_LED1

Description: System LED Wafer

PIN	ASSIGNMENT
1	VCC5
2	GND

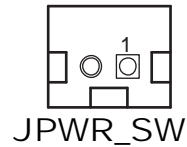


3.5.29 Power Switch Wafer (JPWR_SW)

Connector Location: JPWR_SW

Description: Power Switch Wafer

PIN	ASSIGNMENT
1	LPC_PWRBTNJ
2	GND

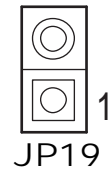


3.5.30 System Reset Wafer (JP19)

Connector Location: JP19

Description: System Reset Wafer

PIN	ASSIGNMENT
1	PM_SYS_RSTJ_FP
2	GND

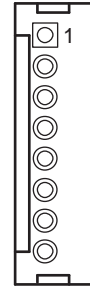


3.5.31 I2C Wafer (JI2C1)

Connector Location: JI2C1

Description: I2C Wafer

PIN	ASSIGNMENT
1	VCC3_3
2	GND
3	GND
4	TOUCH_1V8_SCL_C
5	TOUCH_1V8_SDA_C
6	GND
7	TOUCH_1V8_INT_C
8	TOUCH_1V8_RST_C



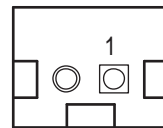
JI2C1

3.5.32 RTC Coin Battery Wafer (JBAT1)

Connector Location: JBAT1

Description: RTC Coin Battery Wafer

PIN	ASSIGNMENT
1	Coin battery +3V
2	GND

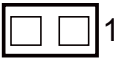



JBAT1

3.5.33 Clear RTC Data Selection (JRTC1)

Jumper Location: JRTC1

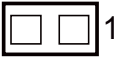

Description: Clear RTC Data Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	Open <i>(Default Setting)</i>	 JRTC1
Clear RTC Data	1-2	 JRTC1

3.5.34 Clear CMOS Data Selection (JCMOS1)

Jumper Location: JCMOS1

Description: Clear CMOS data selection

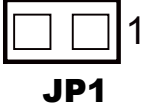
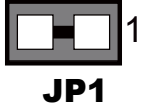
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	Open <i>(Default Setting)</i>	 JCMOS1
Clear CMOS Data	1-2	 JCMOS1

Note: To clear CMOS data, you must power off the computer and set the jumper to “Clear CMOS” as illustrated above. After five to six seconds, set the jumper back to “Normal” and power on the computer.

3.5.35 Unlock the Entire SPI Flash (override descriptor setting)

Jumper Location: JP1

Description: Unlock the Entire SPI Flash (override descriptor setting)

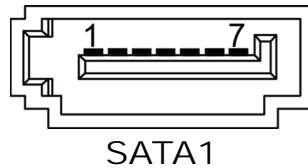
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	Open <i>(Default Setting)</i>	
Override	1-2	

3.5.36 SATA 3.0 Connector (SATA1)

Connector Location: SATA1

Description: Serial ATA 3.0 Connector

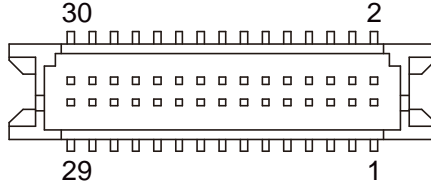
PIN	ASSIGNMENT
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



3.5.37 LVDS Connector (JLVDS1)

Connector Location: JLVDS1

Description: LVDS Connector



JLVDS1

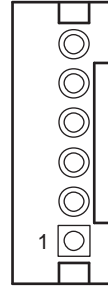
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC3_3	2	GND
3	CLKB_D-	4	CLKB_D+
5	GND	6	B2_D-
7	B2_D+	8	GND
9	B1_D-	10	B1_D+
11	B3_D+	12	B3_D-
13	B0_D+	14	B0_D-
15	GND	16	CLKA_D+
17	CLKA_D-	18	GND
19	A2_D+	20	A2_D-
21	GND	22	A1_D+
23	A1_D-	24	GND
25	A0_D+	26	A0_D-
27	A3_D+	28	A3_D-
29	VCC3_3-	30	VCC3_3

3.5.38 Inverter Connector (JINV1)

Connector Location: JINV1

Description: Inverter Connector

PIN	ASSIGNMENT
1	VCC12V
2	VCC12V
3	GND
4	PWM_DIM
5	GND
6	BL_ENABLE



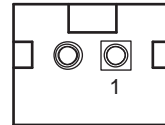
JINV1

3.5.39 HDD Power Port (JHDD_PWR1)

Connector Location: JHDD_PWR1

Description: HDD Power Port

PIN	ASSIGNMENT
1	VCC5
2	GND

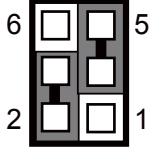
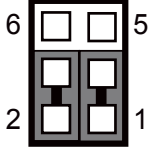
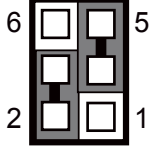
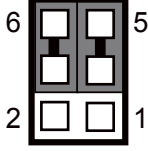
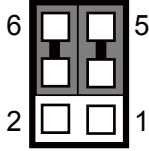
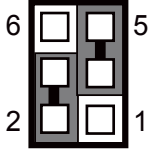
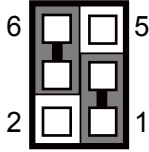
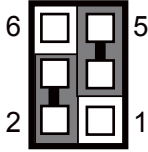


JHDD_PWR1

3.5.40 LVDS Resolution Selection (JP7, JP8)

Jumper Location: JP7, JP8

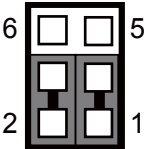
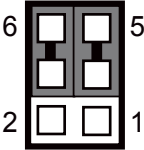
Description: LVDS resolution selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
21.5" 1920x1080	2-4, 3-5 (JP7) 2-4, 1-3 (JP8) <i>(Default Setting)</i>	 <p>JP7</p>	 <p>JP8</p>
15.6" 1366x768	2-4, 3-5 (JP7) 3-5, 4-6 (JP8)	 <p>JP7</p>	 <p>JP8</p>
15" 1024x768	3-5, 4-6 (JP7) 2-4, 3-5 (JP8)	 <p>JP7</p>	 <p>JP8</p>
17" 1280x1024	4-6, 1-3 (JP7) 2-4, 3-5 (JP8)	 <p>JP7</p>	 <p>JP8</p>

3.5.41 LVDS VCC Selection (JP11)

Jumper Location: JP11



Description: LVDS VCC selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
3.3V	1-3, 2-4 <i>(Default Setting)</i>	 <p>JP11</p>
5V	3-5, 4-6	 <p>JP11</p>

3.5.42 LVDS Backlight Control Selection (JP12)

Jumper Location: JP12

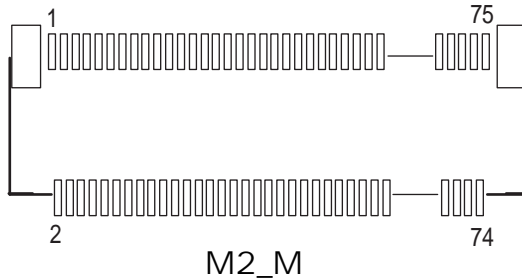
Description: LVDS backlight control selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
3.3V	1-2 <i>(Default Setting)</i>	 <p>JP12</p>
5V	2-3	 <p>JP12</p>

3.5.43 M.2 M-Key Connector for SSD (M2_M)

Connector Location: M2_M

Description: M.2 M-Key Connector for SSD



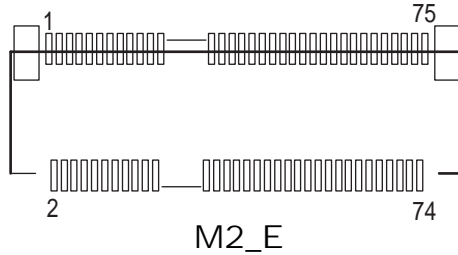
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	47	SATA_TX_N2
2	VCC3_3	49	SATA_TX_P2
3	GND	51	GND
4	VCC3_3	57	GND
21	GND	69	GND
27	GND	70	VCC3_3
33	GND	71	GND
39	GND	72	VCC3_3
41	SATA_RX_P2	73	GND
43	SATA_RX_N2	74	VCC3_3
45	GND	75	GND

Note: M.2 M-key slot supports SATAIII only.

3.5.44 M.2 E-Key Connector for Wi-Fi (M2_E)

Connector Location: M2_E

Description: M.2 E-Key Connector for Wi-Fi



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	45	GND
2	VCC3_3	47	CLKOUT_PCIE_P4
3	USB_4P	49	CLKOUT_PCIE_N4
4	VCC3_3	51	GND
5	USB_4N	52	PERST0
6	WIFI M2_E_LED1	53	PCIE_CLKRQ4_N
7	GND	54	BT WISABLE2
16	BT M2_E_LED2	55	PCH_WAKE_N
18	GND	56	WIFI WISABLE1
33	GND	57	GND
35	PCIE4_8265_TX_DP	63	GND
37	PCIE4_8265_TX_DN	69	GND
39	GND	72	VCC3_3
41	PCIE4_8265_RX_DP	74	VCC3_3
43	PCIE4_8265_RX_DN	75	GND

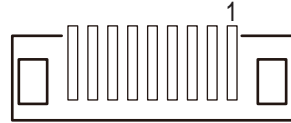
Note: M.2 E key slot supports USB2.0 and PCIe x1 only.

3.5.45 Capacitive Touch Control Board Wafer (OSD_CTRL1)

Connector Location: OSD_CTRL1

Description: Capacitive Touch Control Board Wafer

PIN	ASSIGNMENT
1	Brightness -
2	Brightness +
3	GND
4	VOL +
5	VOL -
6	Monitor ON/OFF
7	EM_LED
8	VCC5
9	VCC3_3



OSD_CTRL1

3.5.46 Flash MCU Firmware Wafer (JMCU)

Connector Location: JMCU

Description: Flash MCU Firmware Wafer

PIN	ASSIGNMENT
1	+5VSB
2	GND
3	MCU_SDA_R
4	MCU_SCL_R



JMCU

4 Software

This chapter contains helpful information about the driver utilities and API.

The following topics are included:

- Driver Disc
- API
- API Function

4.1 Driver Disc

Enclosed with the PA-J600 Series package is our driver utilities, which comes in a DVD-ROM format. Refer to the following table for driver locations

Windows 10 Enterprise 2016 LTSB_64Bit

Filename (Assume that DVD- ROM drive is D :)	Purpose
D:\Driver\Platform\1_Main Chip\Windows 10 Enterprise 2016 LTSB_64Bit	Intel(R) Chipset Device Software Installation Utility
D:\Driver\Platform\2_Hotfix\Windows 10 Enterprise 2016 LTSB(64Bit)	Microsoft Hotfix kb3211320 and kb3213986
D:\Driver\Platform\3_Graphics\Windows 10 Enterprise 2016 LTSB(64Bit)	Intel Graphics Driver installation
D:\Driver\Platform\4_ME	Intel(R) Management Engine Firmware
D:\Driver\Platform\5_LAN Chip\Windows 10 Enterprise 2016 LTSB_64Bit	Intel(R) Network Connections Software
D:\Driver\Platform\6_Sound Codec	Realtek High Definition Audio driver installation
D:\Driver\Platform\7_Serial IO\Windows 10 Enterprise 2016 LTSB_64Bit	Intel(R) Serial IO Driver

Windows 10 Enterprise 2019 LTSC_64Bit

Filename (Assume that DVD- ROM drive is D :)	Purpose
D:\Driver\Platform\1_Main Chip\Windows 10 Enterprise 2019 LTSC_64Bit	Intel(R) Chipset Device Software Installation Utility
D:\Driver\Platform\3_Graphics\Windows 10 Enterprise 2019 LTSC(64Bit)	Intel Graphics Driver installation
D:\Driver\Platform\4_ME	Intel(R) Management Engine Firmware
D:\Driver\Platform\6_Sound Codec	Realtek High Definition Audio driver installation
D:\Driver\Platform\7_Serial IO\Windows 10 Enterprise 2019 LTSC_64Bit	Intel(R) Serial IO Driver

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

4.1.1 Installing Intel® Chipset Software Installation Utility

Introduction

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

- SATA Storage Support (SATA & SATA II)
- USB Support (1.1 & 2.0)
- Identification of Intel® Chipset Components in Device Manager

Intel® Chipset Software Installation Utility

The utility pack is to be installed only for Windows 10 Enterprise 2016 / 2019 LTSB_64Bit, and it should be installed immediately after the OS installation is finished. Please follow the steps below:

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk.
- 2** Enter the “**Main Chip**” folder where the Chipset driver is located.
- 3** Select your Windows 10 platform.
- 4** Click “**SetupChipset.exe**” file for driver installation.
- 5** Follow the on-screen instructions to install the driver.
- 6** Once the installation is completed, shut down the system and restart PA-J600 for the changes to take effect.

4.1.2 Intel® Management Engine Components Installer Installation

To install the ME Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk
- 2** Enter the “**ME**” folder where the driver is located
- 3** Click “**SetupME.exe**” file for driver installation.
- 4** Follow the on-screen instructions to install the driver.
- 5** Once the installation is completed, shut down the system and restart PA-J600 for the changes to take effect.

4.1.3 Microsoft Hotfix Driver installation

Introduction

The Microsoft Hotfix kb3211320 and kb3213986 Driver that needs to be installed depends on the system's specific hardware and firmware features. The installer, compatible with Windows 10, detects the system's capabilities and installs the relevant drivers and applications.

Installation Instructions for Windows 10

To install the utility, simply follow the following steps:

- 1** Insert the driver disk into a DVD-ROM device.
- 2** Open the “**Hotfix**” folder where the driver is located
- 3** Click the “**windows10.0-kb3211320-x64 and windows10.0-kb3213986- x64 files**” file for critical security update.
- 4** Follow the on-screen instructions to complete the installation
- 5** Once the installation is completed, shut down the system and restart PA-J600 for the changes to take effect.

4.1.4 Installing Graphics Driver Utility

The GRAPHICS interface embedded in PA-J600 can support a wide range of display types. You can have dual displays via LCD and LVDS interfaces and make the system work simultaneously.

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

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk.
- 2** Enter the “**Graphics**” folder where the driver is located
- 3** Select your Windows 10 platform.
- 4** Click the “**Setup.exe**” file for Windows 10 Enterprise **2016** LTSB(64Bit) platform for driver installation.
Click the “**igxpın.exe**” file for Windows 10 Enterprise **2019** LTSB(64Bit) platform for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart PA-J600 for the changes to take effect.

4.1.5 Installing LAN Driver Utility

Enhanced with LAN function, PA-J600 supports various network adapters.

To install the LAN Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk.
- 2** Enter the “**LAN Chip**” folder where the driver is located
- 3** Click “**Autorun.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-J600 for the changes to take effect.

For more details on the installation procedure, refer to the *Readme.txt* file that you can find on LAN Driver Utility.

4.1.6 Installing Sound Driver Utility

The sound function enhanced in this system is fully compatible with Windows 10.

To install the Sound Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk.
- 2** Open the “**Sound Codec**” folder where the driver is located.
- 3** Click the “**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-J600 for the changes to take effect.

4.1.7 Installing Intel® Serial I/O Driver Utility

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

- 1** Connect the USB DVD-ROM device to PA-J600 and insert the driver disk.
- 2** Open the “**Serial IO**” folder where the driver is located.
- 3** Click the “**SetupSerialIO.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-J600 for the changes to take effect.

4.2 API

4.2.1 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
	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

4.2.2 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**

```
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 Digital_Set Lib "Digital.dll"(ByVal hex_value As Short) As Long

Declare Function Digital_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

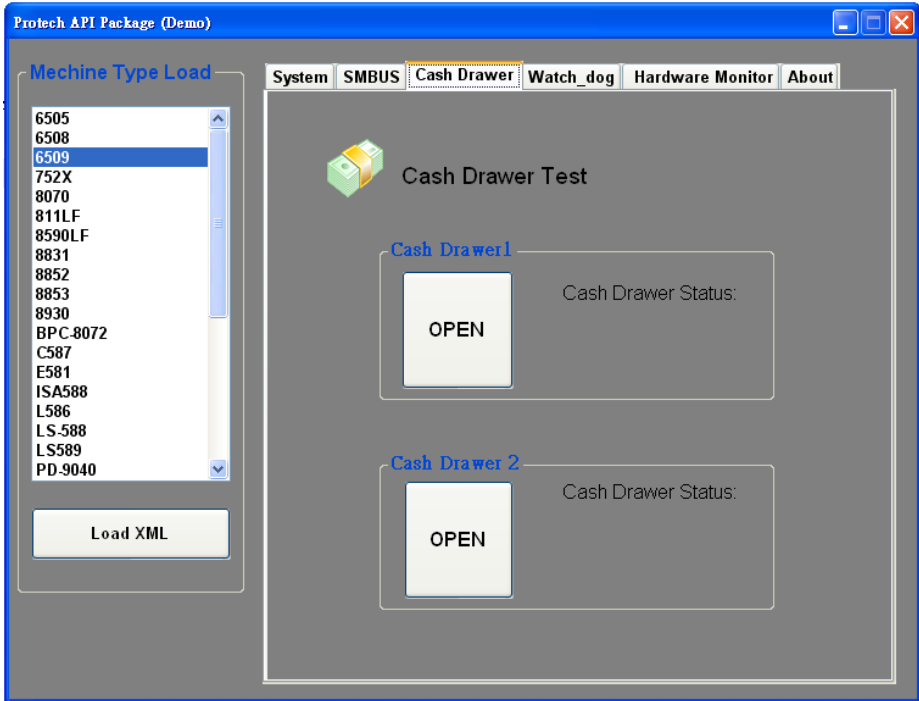
VB 6 external function:

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

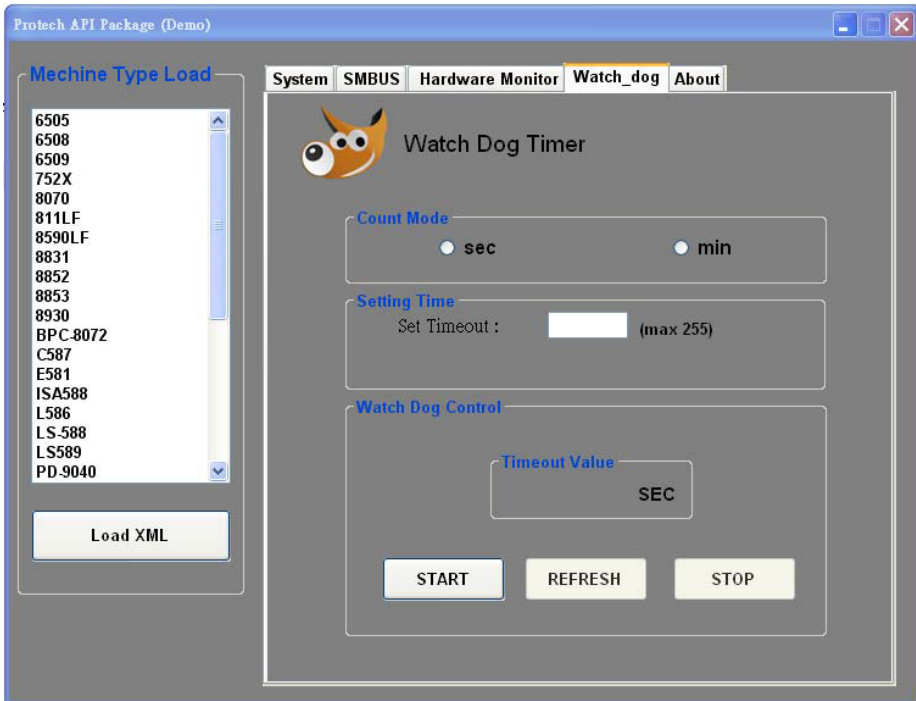
Note: VB.net short = integer VB6

4.2.3 Cash Drawer



Button/Item	Description
OPEN	Tap to open the cash drawer.
Cash Drawer Status	<p>Cash drawer status will be displayed after OPEN is tapped.</p> <ul style="list-style-type: none"> • Cash Drawer is closed when the following picture is shown: <div data-bbox="634 1189 868 1293" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Cash Drawer Status: Close </div> • Cash Drawer is opened when the following picture is shown: <div data-bbox="634 1371 868 1484" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Cash Drawer Status: Open </div>

4.2.4 Watchdog



Button/Item	Description
Count Mode	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	<ul style="list-style-type: none"> • 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.

4.3 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)	Watchdog_Set Watchdog_Stop Watchdog_SetMinSec Watchdog_Recount		WatchDog.dll

4.3.1 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

4.3.2 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

5

BIOS SETUP

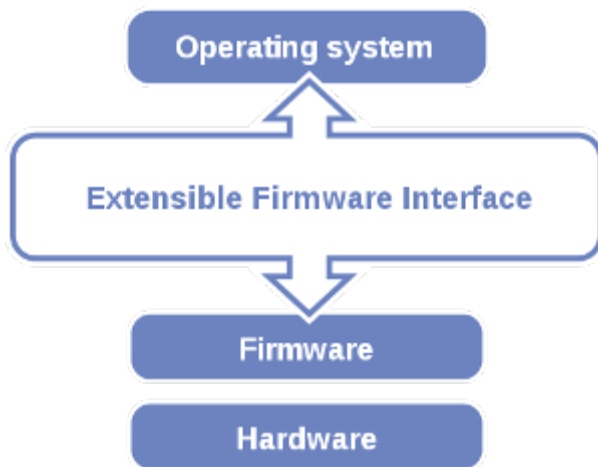
This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in BIOS NVRAM so that the Setup information is retained when the system is powered off. The BIOS Setup Utilities consist of the following menu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

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

5.1 Introduction

The **PA-J600** 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.



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 or <ESC> key after the POST memory test begins and before the operating system boot begins. The settings are shown below.

Users will need to set up the system configuration from the BIOS Setup Utility when any of the following conditions occurs:

1. You are starting your system for the first time.
2. You have changed the hardware in your system or the hardware becomes faulty.
3. The system configuration is reset after the user configures to clear CMOS data via the JCMOS1 jumper.
4. The power of the CMOS RAM became lost and the system configuration has been erased.

All the menu settings are described in details in this chapter.

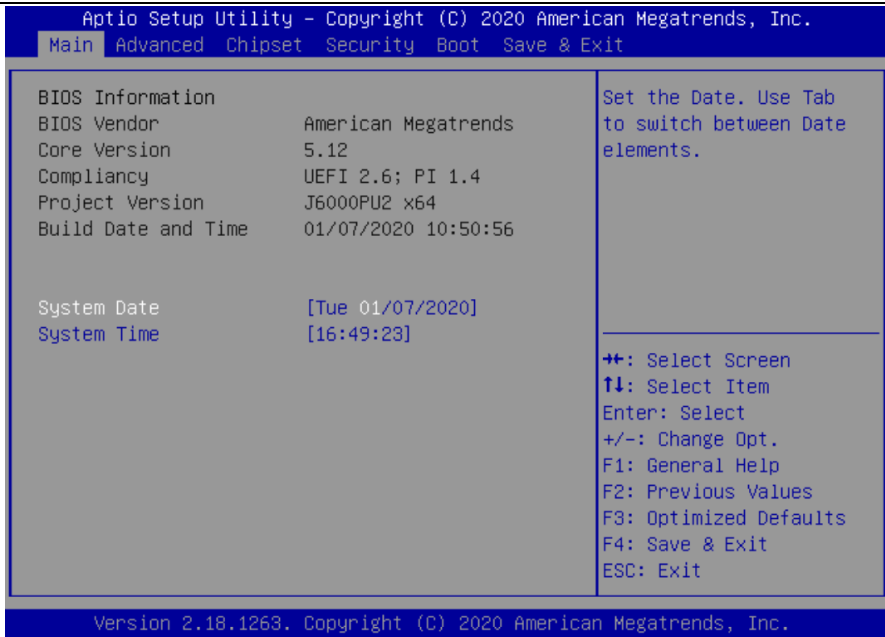
5.1.1.1 Accessing Setup Utility

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:



POST Screen with AMI Logo

As long as this message is present on the screen you may press the 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:



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.

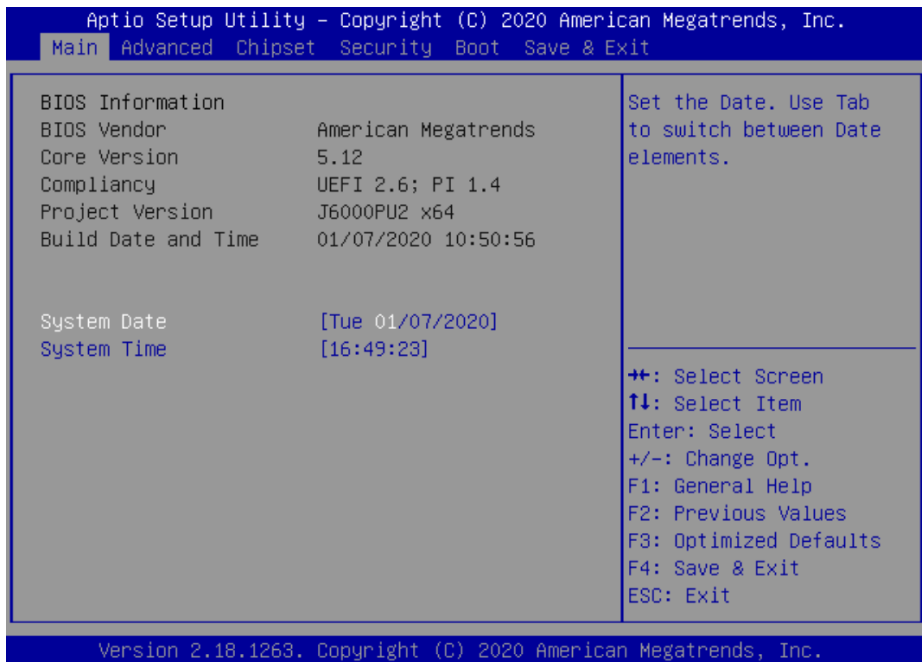
The language of the BIOS setup menu interface and help messages are shown in US English. You may use <↑> or <↓> key to select among the items and press <Enter> to confirm and enter the sub-menu. The following table provides the list of the navigation keys that you can use while operating the BIOS setup menu.

BIOS Setup Navigation Key	Description
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from the selected item upwards or downwards)
<Enter>	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

5.1.2 Main

Menu Path *Main*

The **Main** menu allows you to view the BIOS Information and change the system date and time. Use tab to switch between date elements. Use <↑> or <↓> arrow keys to highlight the item and enter the value you want in each item. This screen also displays the BIOS version (project) and BIOS Build Date and Time.



BIOS Main Menu

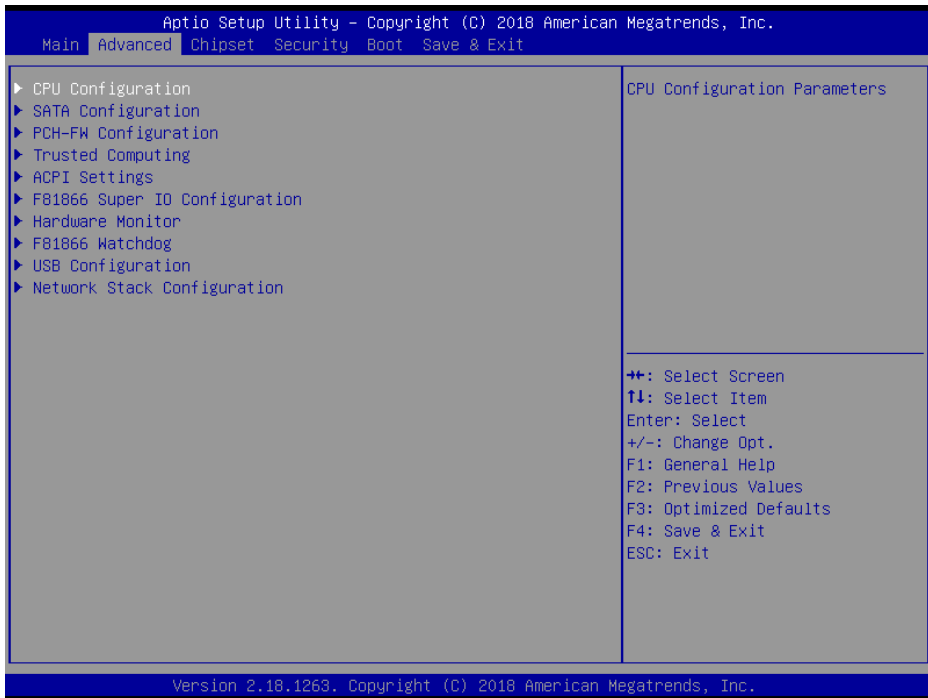
BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliance	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version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

BIOS Setting	Options	Description/Purpose
System Date	month, day, year	Set the current date. The format is [Day Month/Date/ Year]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it. The “Day” is automatically changed.
System Time	hour, minute, second	Set the clock of the system. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.

5.1.3 Advanced

Menu Path *Advanced*

This menu provides advanced sub-menu items such as CPU Configuration, SATA Configuration, Intel(R) Rapid Storage Technology, PCH-FW Configuration, Trusted Computing, ACPI Settings, F81866 Super IO Configuration, Hardware Monitor, F81866 Watchdog, USB Configuration and Network Stack Configuration.



BIOS Advanced Menu

BIOS Setting	Options	Description/Purpose
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
SATA Configuration	Sub-Menu	SATA Device Options Settings.
PCH-FW Configuration	Sub-Menu	Management Engine Technology Parameters.
Trusted Computing	Sub-Menu	Trusted Computing Settings.
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
USB Configuration	Sub-Menu	USB Configuration Parameters.
Network Stack Configuration	Sub-Menu	Network Stack Settings

5.1.3.1 Advanced - CPU Configuration

Menu Path *Advanced > CPU Configuration*

The **CPU Configuration** provides advanced CPU settings and some information about CPU.



CPU Configuration Screen

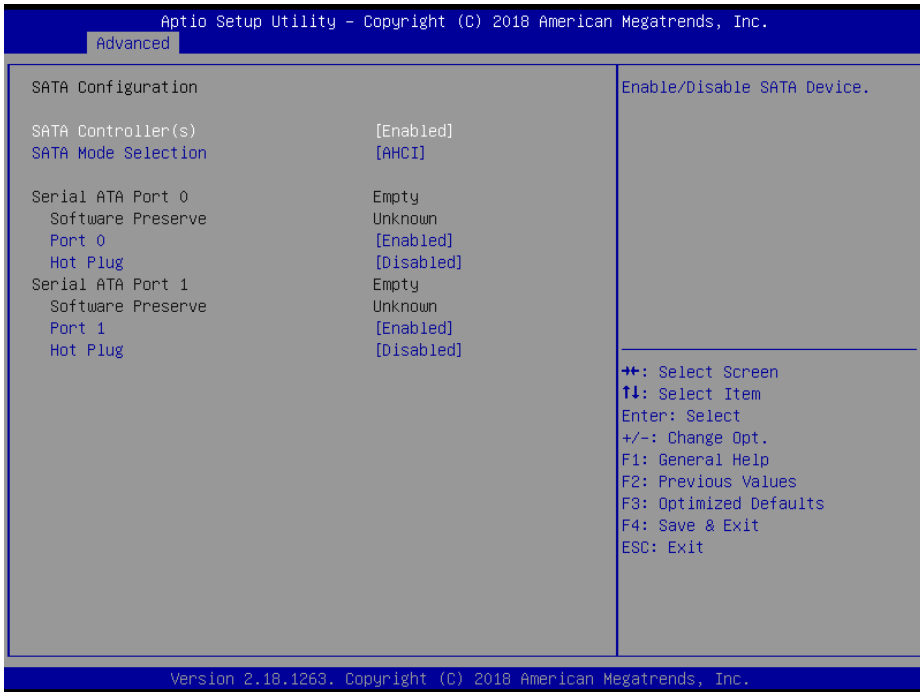
BIOS Setting	Options	Description/Purpose
Type	No changeable options	Displays the CPU Type.
ID	No changeable options	Displays the CPU ID.
Microcode Revision	No changeable options	Displays the CPU Microcode Revision.
Speed	No changeable options	Displays the CPU Speed.
Number of Processors	No changeable options	Displays the CPU Number of Processors.
VMX	No changeable options	CPU VMX hardware support for virtual machines.
SMX (Secure Mode Extensions) / TXT	No changeable options	Secure Mode extensions support.

BIOS Setting	Options	Description/Purpose
L1 Data Cache	No changeable options	Displays the size of L1 Data Cache
L1 Instruction Cache	No changeable options	Displays the size of L1 Instruction Cache
L2 Cache	No changeable options	Displays the size of L2 Cache.
L3 Cache	No changeable options	Displays the size of L3 Cache.
L3 Cache	No changeable options	Displays the size of L4 Cache.
Hyper-Threading	- Disabled - Enabled	When Disabled, only one thread per enabled core is enabled.
Intel (VMX) Virtualization Technology	- Disabled - Enabled	When enabled, VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

5.1.3.2 Advanced - SATA Configuration

Menu Path *Advanced > SATA Configuration*

The **SATA Configuration** allows users to enable / disable the SATA controller as well as the operational mode after the SATA controller is enabled. The following screen indicates the functions available when the SATA controller is enabled and the AHCI mode is selected.



SATA Configuration Screen

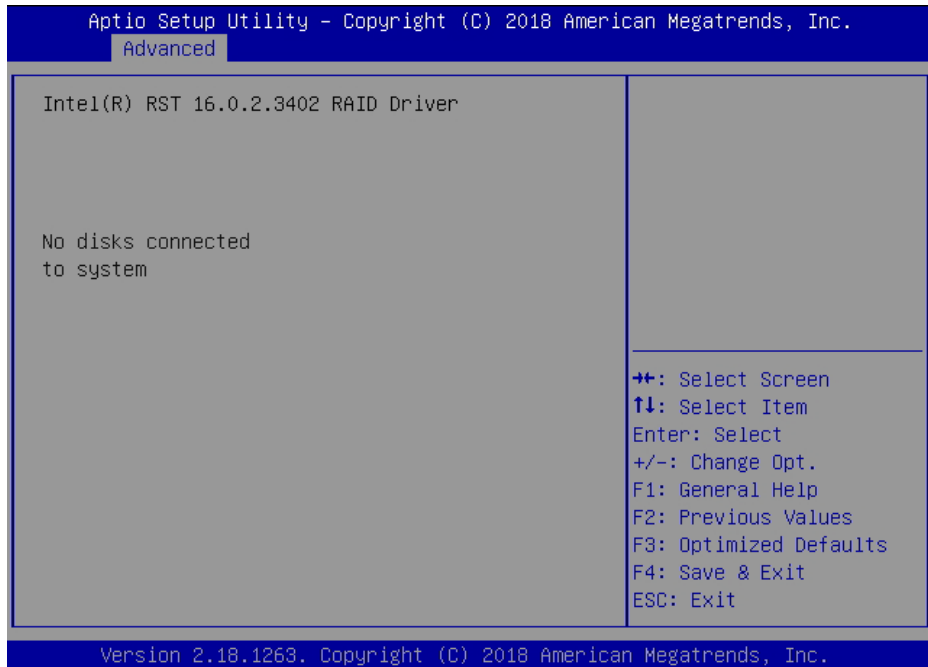
BIOS Setting	Options	Description/Purpose
SATA Controller(s)	- Disabled - Enabled	Enables or Disables SATA Device.
SATA Mode Selection	- AHCI - RAID	Determines how SATA controller(s) operate.
Serial ATA Port 0 – 1	No changeable options	Displays the SATA device’s name.
Software Preserve	No changeable options	Indicates whether the connected SATA device supports Software Setting Preservation (SSP).
Port 0 - 1	- Disabled - Enabled	Enables or Disables SATA Port Device.

BIOS Setting	Options	Description/Purpose
HotPlug	- Disabled - Enabled	Enables or Disables Hot Plug function to designate a SATA port device as hot-pluggable.

5.1.3.3 Advanced – Intel(R) Rapid Storage Technology

Menu Path *Advanced > Intel(R) Rapid Storage Technology*

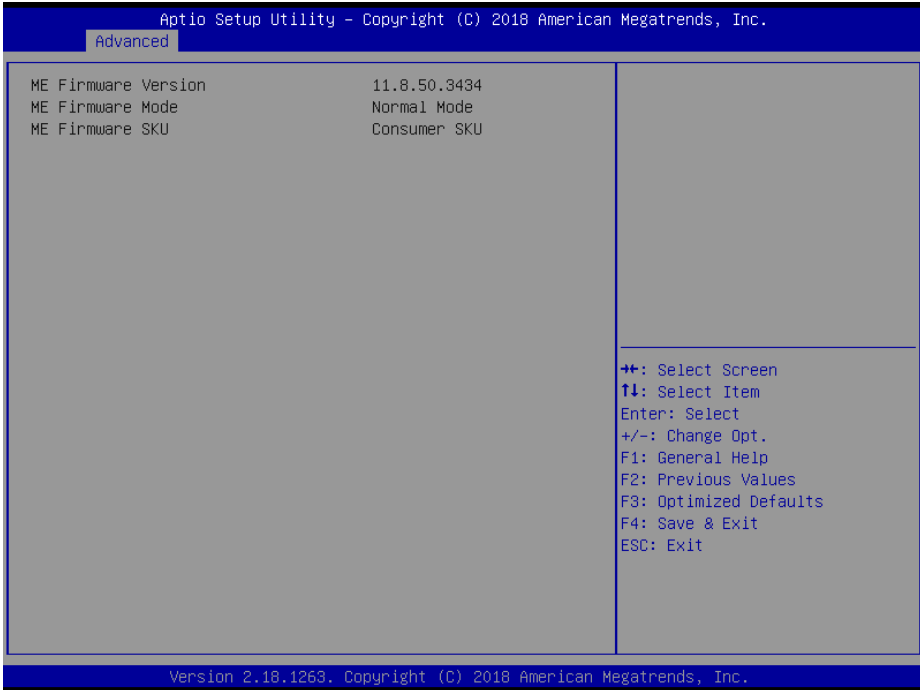
The **Intel(R) Rapid Storage Technology** allows users to manage RAID volumes on the Intel(R) RAID Controller. This menu will only appear when SATA controller is enabled and the RAID mode is selected.



5.1.3.4 Advanced - PCH-FW Configuration

Menu Path *Advanced > PCH-FW Configuration*

The **PCH-FW** allows users to view the information about ME (Management Engine) firmware information, such ME firmware version, firmware mode and firmware SKU.



PCH-FW Configuration Screen

BIOS Setting	Options	Description/Purpose
ME Firmware Version	No changeable options	Displays the ME Firmware Version.
ME Firmware Mode	No changeable options	Displays the ME Firmware Mode.
ME Firmware SKU	No changeable options	Displays the ME Firmware SKU.

5.1.3.5 Advanced - Trusted Computing

Menu Path *Advanced > Trusted Computing*

The **Trusted Computing** allows users to enable / disable BIOS support for security device. The operating system will now show Security Device. The TCG EFI protocol and INT1A interface will not be available.



Trusted Computing Screen

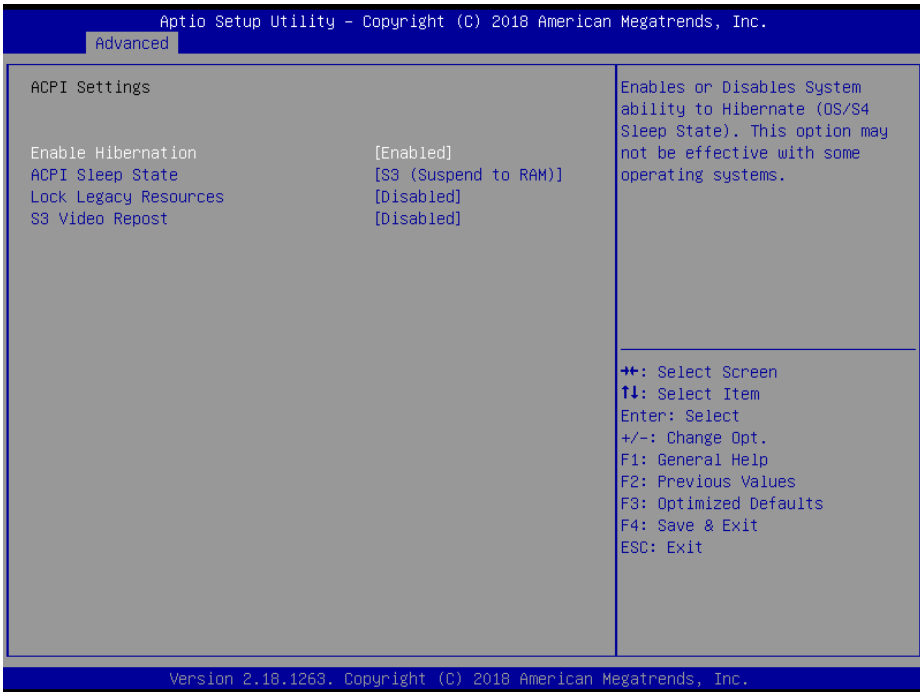
BIOS Setting	Options	Description/Purpose
Security Device Support	- Disabled - Enabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
TPM State	- Disabled - Enabled	Enables / Disables Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.

BIOS Setting	Options	Description/Purpose
Pending operation	<ul style="list-style-type: none"> - None - TPM Clear 	<p>Schedules an Operation for the Security Device.</p> <p>NOTE: Your Computer will reboot during restart in order to change State of Security Device.</p>
Device Select	<ul style="list-style-type: none"> - TPM 1.2 - TPM 2.0 - Auto 	<p>TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.</p>
TPM Enabled Status	No changeable options	Displays the TPM Enabled Status.
TPM Active Status	No changeable options	Displays the TPM Active Status.
TPM Owner Status	No changeable options	Displays the TPM Owner Status.

5.1.3.6 Advanced - ACPI Settings

Menu Path *Advanced > ACPI Settings*

The **ACPI Settings** allows users to configure relevant ACPI (Advanced Configuration and Power Management Interface) settings, such as enable / disable Hibernation, ACPI Sleep State, lock legacy resources and S3 Video Repost.



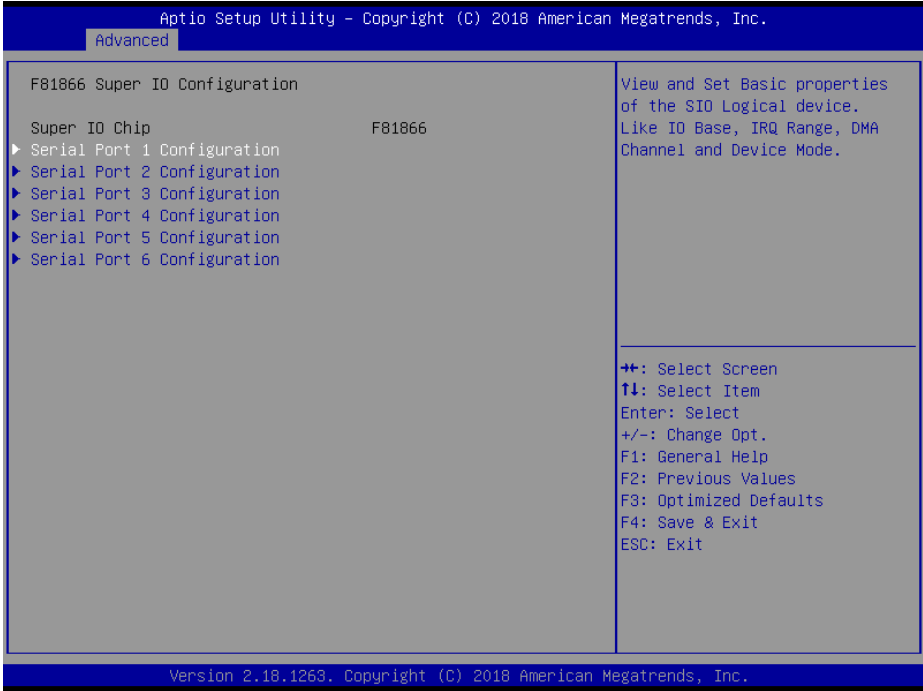
ACPI Settings Screen

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.
ACPI Sleep State	- Suspend Disabled - S3 (Suspend to RAM)	Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
Lock Legacy Resources	- Disabled - Enabled	Enables or Disables Lock of Legacy Resources.
S3 Video Repost	- Disabled - Enabled	Enables or Disables S3 Video Repost.

5.1.3.7 Advanced - F81866 Super IO Configuration

Menu Path *Advanced > F81866 Super IO Configuration*

The **F81866 Super IO Configuration** allows users to configure the serial ports 1-6.



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).
Serial Port 5 Configuration	Sub-Menu	Configure the parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Sub-Menu	Configure the parameters of Serial Port 6 (COMF).

F81866 Super IO Configuration – Serial Port 1 Configuration

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



Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- 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=3,4,5,6,7,10,11; - IO=2F8h; IRQ=3,4,5,6,7,10,11; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11;	Select IRQ and I/O resource settings for Serial Port 1.
Mode	- RI - 5V - 12V	Disable or select 12V / 5V voltage for COM1.

F81866 Super IO Configuration – Serial Port 2 Configuration

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

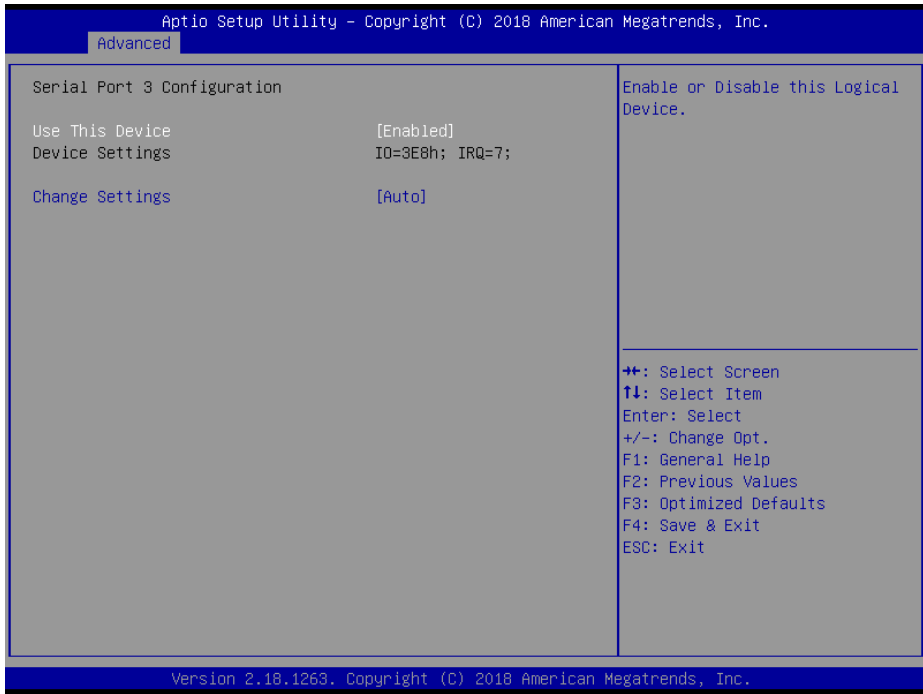


Serial Port 2 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- 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=3,4,5,6,7,10,11; - IO=2F8h; IRQ=3,4,5,6,7,10,11; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11;	Select IRQ and I/O resource for the serial port 2.

F81866 Super IO Configuration – Serial Port 3 Configuration

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

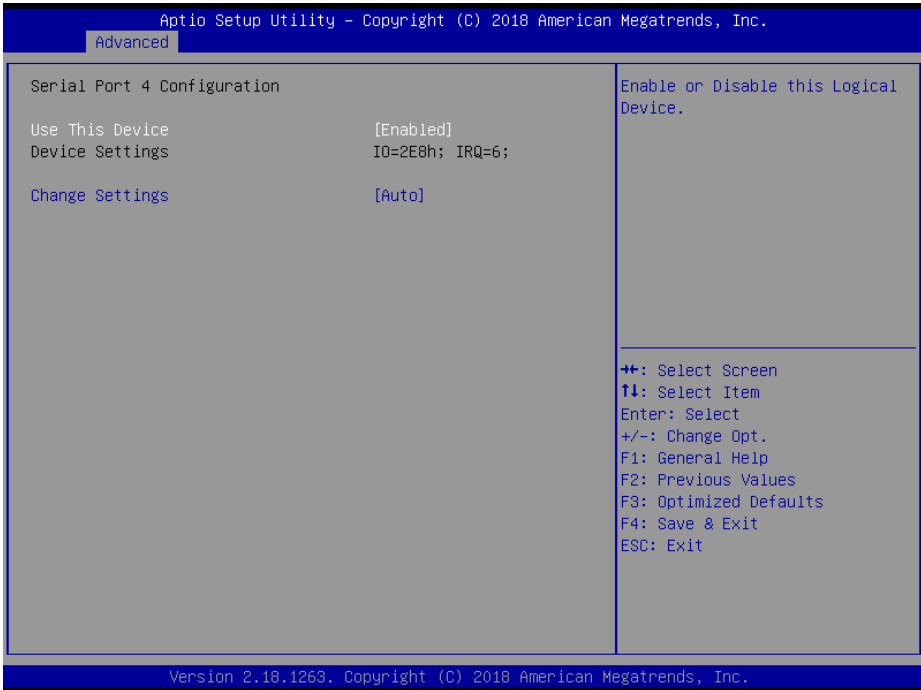


Serial Port 3 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- 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=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Select IRQ and I/O resource for the serial port 3.

F81866 Super IO Configuration – Serial Port 4 Configuration

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

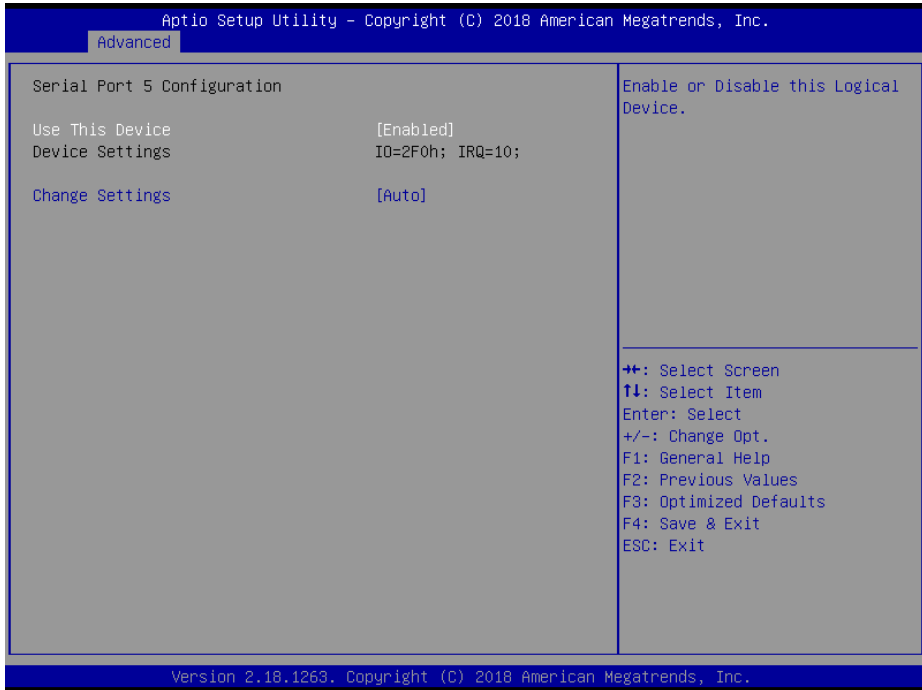


Serial Port 4 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- 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=6; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Select IRQ and I/O resource for the serial port 4.

F81866 Super IO Configuration – Serial Port 5 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 5 Configuration*

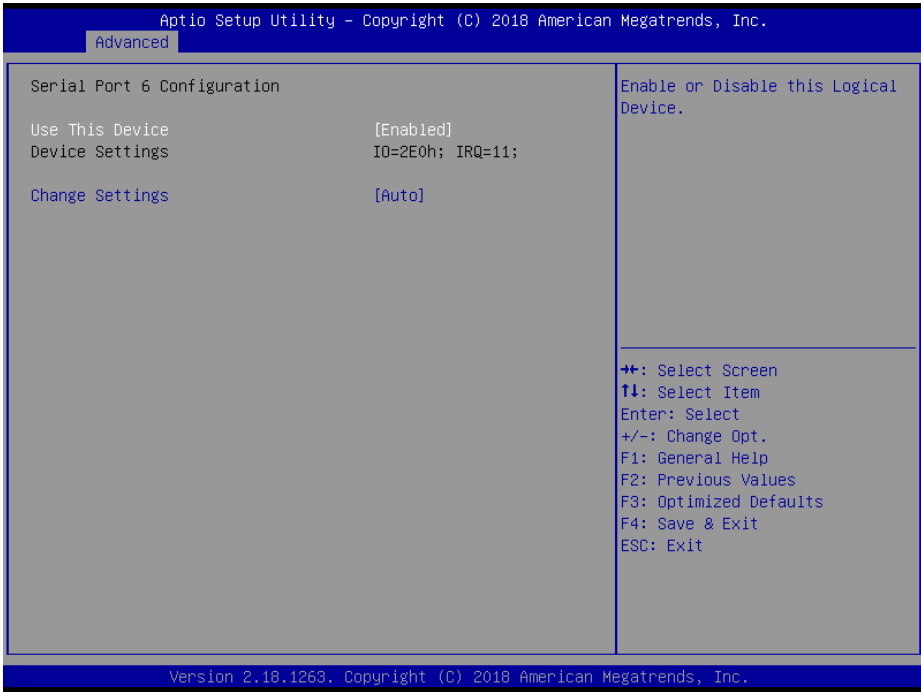


Serial Port 5 Configuration Screen

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

F81866 Super IO Configuration – Serial Port 6 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 6 Configuration*



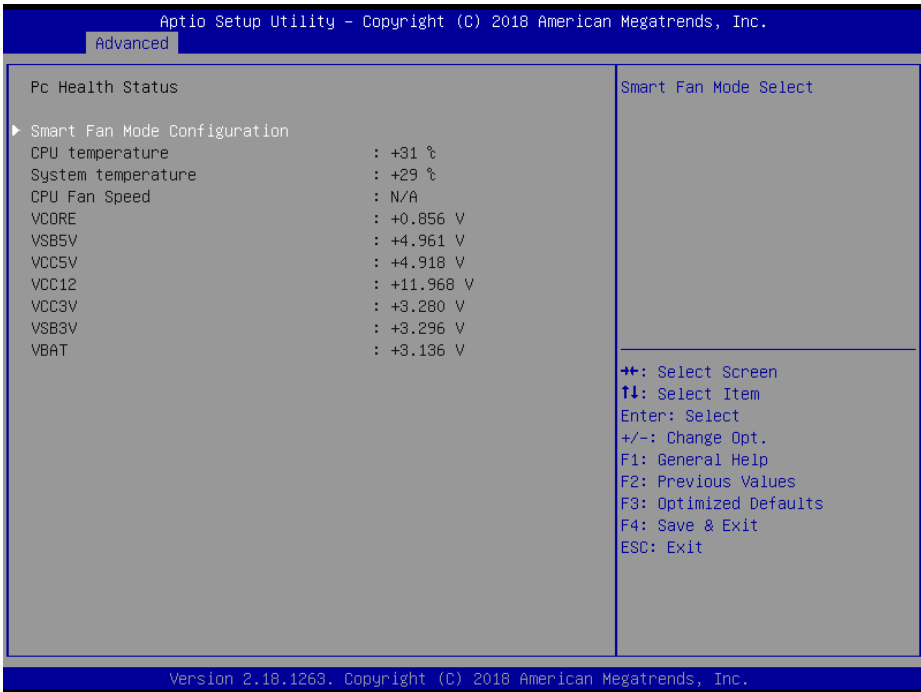
Serial Port 6 Configuration Screen

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

5.1.3.8 Advanced - Hardware Monitor

Menu Path *Advanced > Hardware Monitor*

The **Hardware Monitor** allows users to monitor the health and status of the system such as CPU temperature, system temperature, CPU fan speed, system fan speed and voltage levels in supply.



Hardware Monitor Screen

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	Sub-Menu	Smart Fan Mode Selection. Note: No CPU Fan is used on PA-J600.
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system's temperature.
CPU Fan Speed	No changeable options	Displays CPU Fan speed. Note: Because no CPU Fan is used on PA-J600, so "N/A" is shown for this item.
VCCORE	No changeable options	Displays the voltage level of VCCORE in supply.

BIOS Setting	Options	Description/Purpose
VSB5V	No changeable options	Detects and displays the voltage level of the VSB5V in supply.
VCC5V	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.

Smart Fan Mode Configuration (No Fan is used on PA-J600.)

Menu Path *Advanced > Hardware Monitor > Smart Fan Mode Configuration*



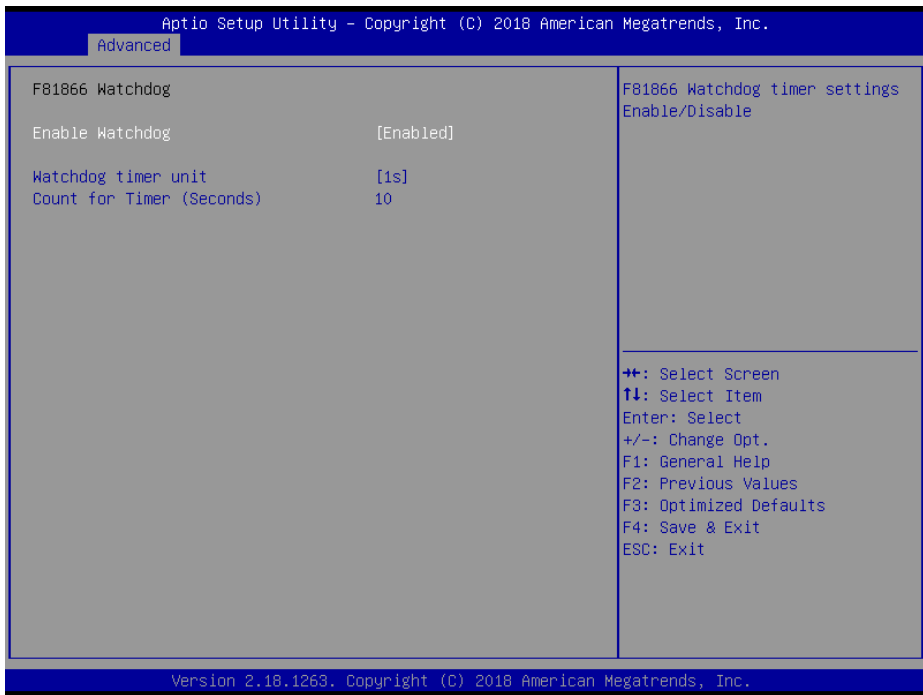
Smart Fan Mode Configuration Screen

BIOS Setting	Options	Description/Purpose
CPU Fan Smart Fan Control	- Manual Duty Mode - Auto Duty-Cycle Mode	Smart Fan Mode select for CPU Fan.
Manual Duty Mode	Numeric (from 1 to 100)	Manual mode fan control, user can write expected duty cycle (PWM fan type) 1-100.

5.1.3.9 Advanced - F81866 Watchdog

Menu Path *Advanced > F81866 Watchdog*

If the system hangs or fails to respond, enable the F81866 watchdog function to trigger a system reset via the 255-level watchdog timer.



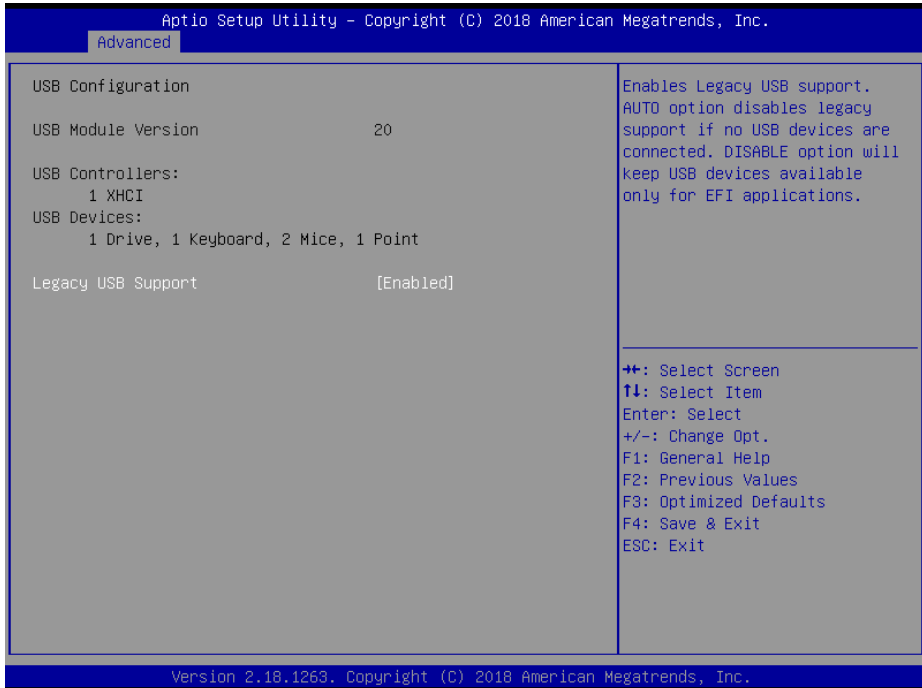
F81866 Watchdog Screen

BIOS Setting	Options	Description/Purpose
Enable WatchDog	- Enabled - Disable	Enable/ Disable F81866 Watchdog 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.

5.1.3.10 Advanced - USB Configuration

Menu Path *Advanced > USB Configuration*

The **USB Configuration** allows users to configure advanced USB settings such as USB mass storage driver support.



USB Configuration Screen

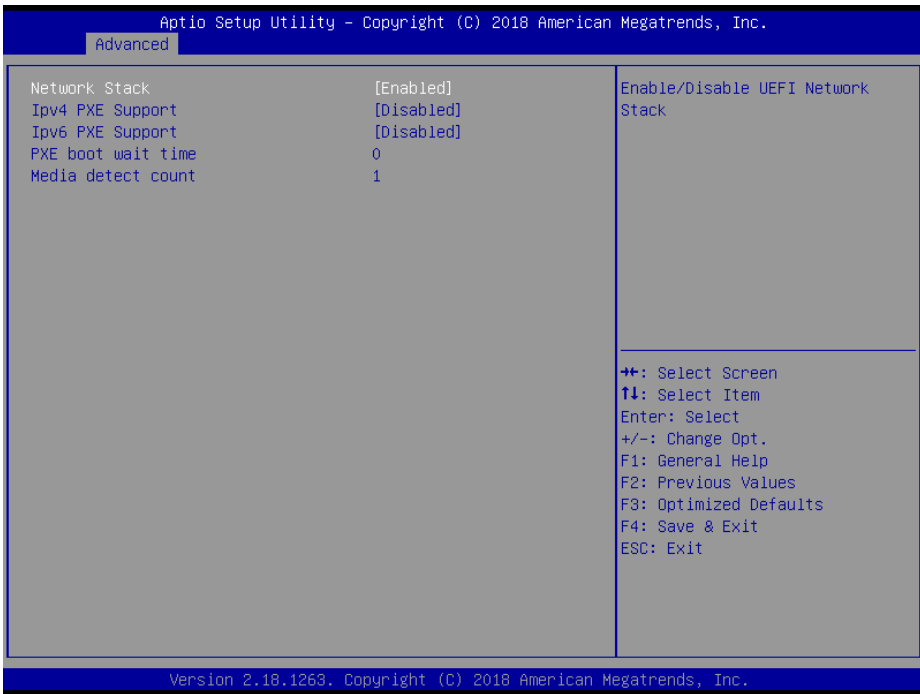
BIOS Setting	Options	Description/Purpose
Legacy USB Support	- Disabled - Enabled	Enables support for legacy USB.

5.1.3.11 Advanced - Network Stack Configuration

Menu Path *Advanced > Network Stack Configuration*

The **Network Stack Configuration** allows users to enable/disable UEFI Network Stack, IPv4/IPv6 PXE (Pre-Boot Execution) support and configure PXE boot wait time and detects the media presence.

PXE allows a workstation to boot from a server on a network prior to booting the operating system on the local hard drive. A PXE-enabled workstation connects its NIC to the LAN via a jumper, which keeps the workstation connected to the network even when the power is turned off.



Network Stack Configuration Screen

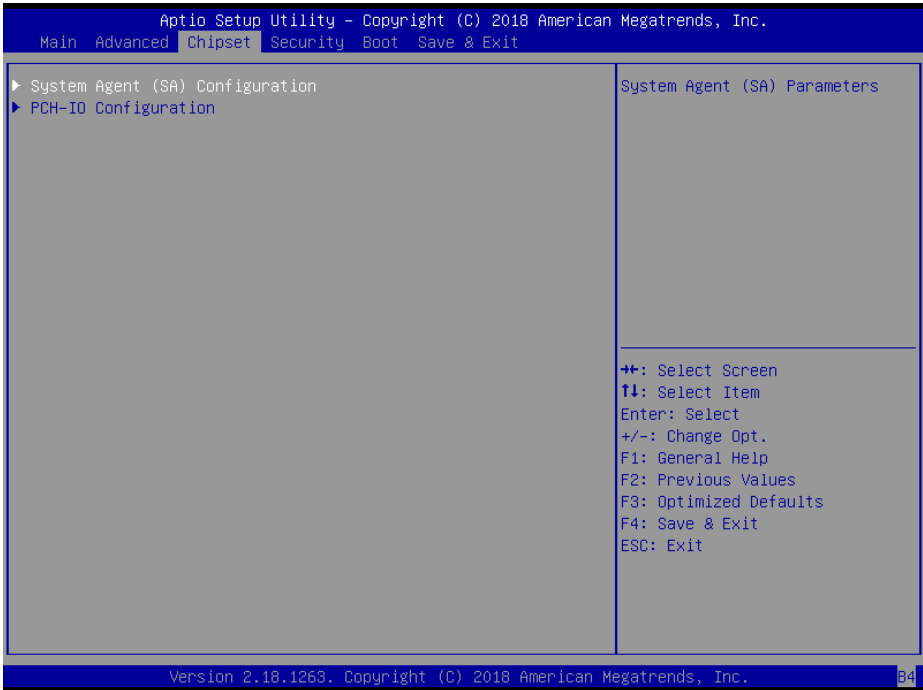
BIOS Setting	Options	Description/Purpose
Network Stack	- Disabled - Enabled	Enables or Disables UEFI Network Stack.
Ipv4 PXE Support	- Disabled - Enabled	Enables Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.

BIOS Setting	Options	Description/Purpose
Ipv6 PXE Support	- Disabled - Enabled	Enables Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
PXE boot wait time	Numeric (from 0 to 5)	Number of seconds to wait for PXE boot to abort after the Esc key is pressed.
Media detect count	Numeric (from 1 to 50)	Number of times that the media presence will be checked.

5.1.4 Chipset

Menu Path *Chipset*

This menu allows users to configure advanced Chipset settings such as System Agent (SA) and PCH-IO configuration parameters.



Chipset Menu Screen

BIOS Setting	Options	Description/Purpose
System Agent (SA) Parameters	Sub-Menu	Sets the Parameter for System Agent (SA) configuration.
PCH-IO Configuration	Sub-Menu	Sets the Parameter for PCH configuration.

5.1.4.1 System Agent (SA) Configuration

Menu Path *Chipset > System Agent (SA) Configuration*

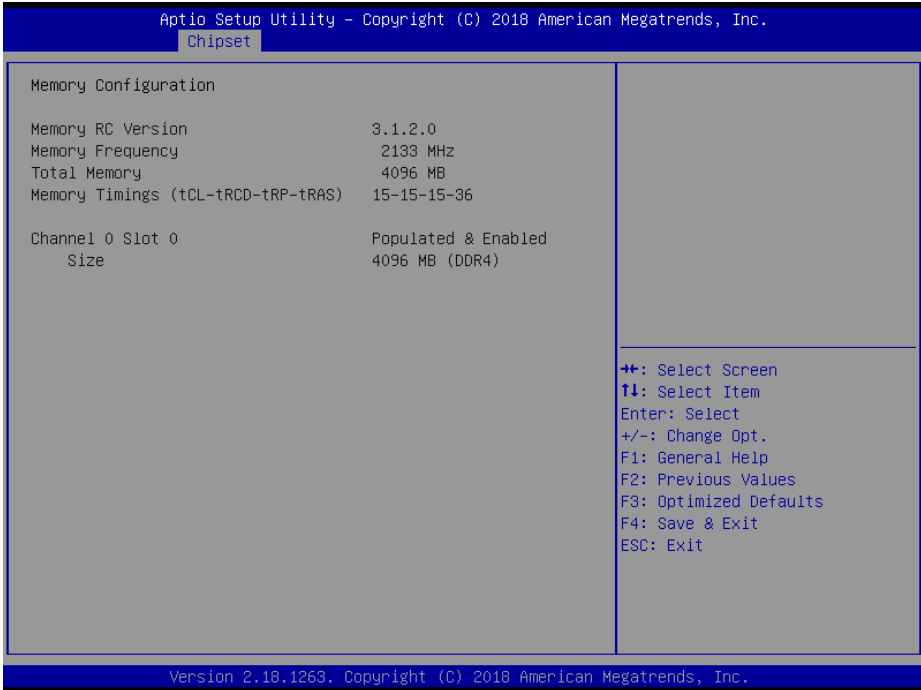


System Agent (SA) Configuration Screen

BIOS Setting	Options	Description/Purpose
SA PCIe Code Version	No changeable options	Displays the SA PCIe Code Version.
VT-d	No changeable options	Displays VT-d capability support.
Memory Configuration	Sub-Menu	Memory Configuration parameters
VT-d	- Disabled - Enabled	Enables or Disables VT-d function.

System Agent (SA) Configuration – Memory Configuration

Menu Path *Chipset > System Agent (SA) Configuration > Memory Configuration*



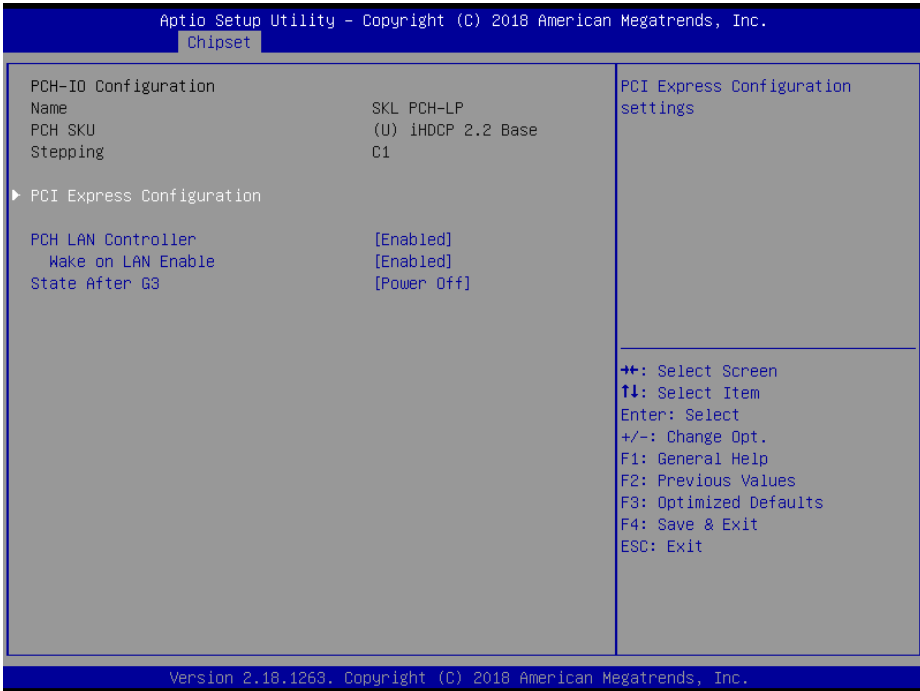
Memory Configuration Screen

BIOS Setting	Options	Description/Purpose
Memory RC Version	No changeable options	Displays the Memory RC Version.
Memory Frequency	No changeable options	Displays the Frequency of Memory.
Total Memory	No changeable options	Displays the Total Memory.
Memory Timings (tCL-tRCD-tRP-tRAS)	No changeable options	Displays the Memory Timings.
Channel 0 Slot 0	No changeable options	Displays the state of Channel 0 Slot 0.
Size	No changeable options	Displays the size of Channel 0 Slot 0.

5.1.4.2 PCH IO Configuration

Menu Path *Chipset > PCH IO Configuration*

The **PCH-IO Configuration** allows users to configure North Bridge chipset, set PCI Express configuration parameters, enable/disable PCH LAN Controller and Wake-On-LAN function and determine the power on/off state that the system will go to following a power failure (G3 state).



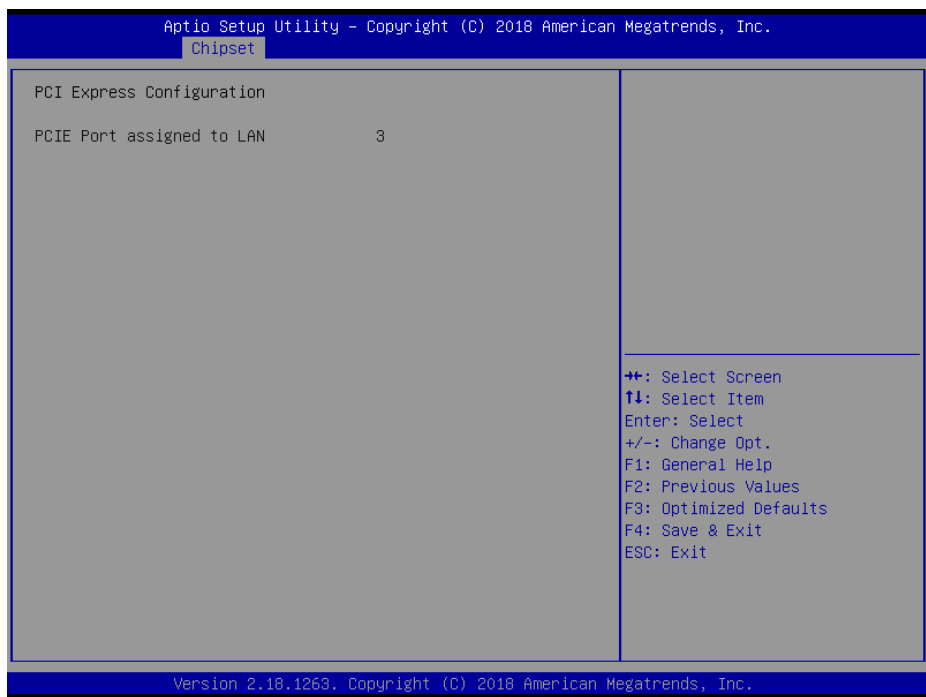
PCH-IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Name	No changeable options	Displays the Intel PCH Name.
PCH SKU	No changeable options	Displays the Intel PCH SKU.
Stepping	No changeable options	Displays the Intel PCH Stepping.
PCI Express Configuration	Sub-Menu	PCI Express Configuration settings.
PCH LAN Controller	- Disabled - Enabled	Enables or Disables onboard NIC.

BIOS Setting	Options	Description/Purpose
Wake on LAN Enable	- Disabled - Enabled	Enables or Disables integrated LAN to wake the system.
State After G3	- Power On - Power Off	Specifies the Power On/Off state that the system will go to when the power is re-applied following a power failure (G3 state).

PCH-IO Configuration – PCI Express Configuration

Menu Path *Chipset > PCH-IO Configuration > PCI Express Configuration*



PCI Express Configuration Screen

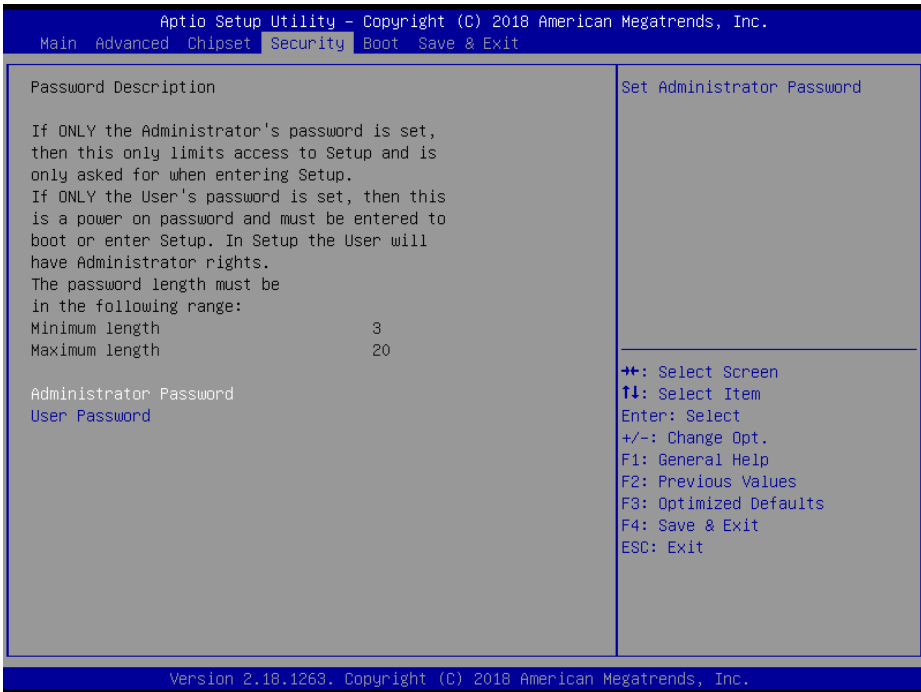
BIOS Setting	Options	Description/Purpose
PCIE Port assigned to LAN	No changeable options	Displays the LAN assigned PCIE Port.

5.1.5 Security

Menu Path *Security*

From the **Security** menu, you are allowed to create, change or clear the administrator password. You will be asked to enter the configured administrator password before you can access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. An administrator has much more privileges over the settings in the Setup utility than a user. Heed that a user password does not provide access to most of the features in the Setup utility.



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.

Create an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Enter the password you want to create. A password can be 3-20 alphanumeric characters.
After you have configured the password, press <Enter> to confirm.
3. Type the new password again and press <Enter>.

Change an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the Administrator Password or User Password that you want to change. A password can be 3-20 alphanumeric characters. After you have changed the password, press <Enter> to confirm.
3. Type the changed password again and press <Enter>.

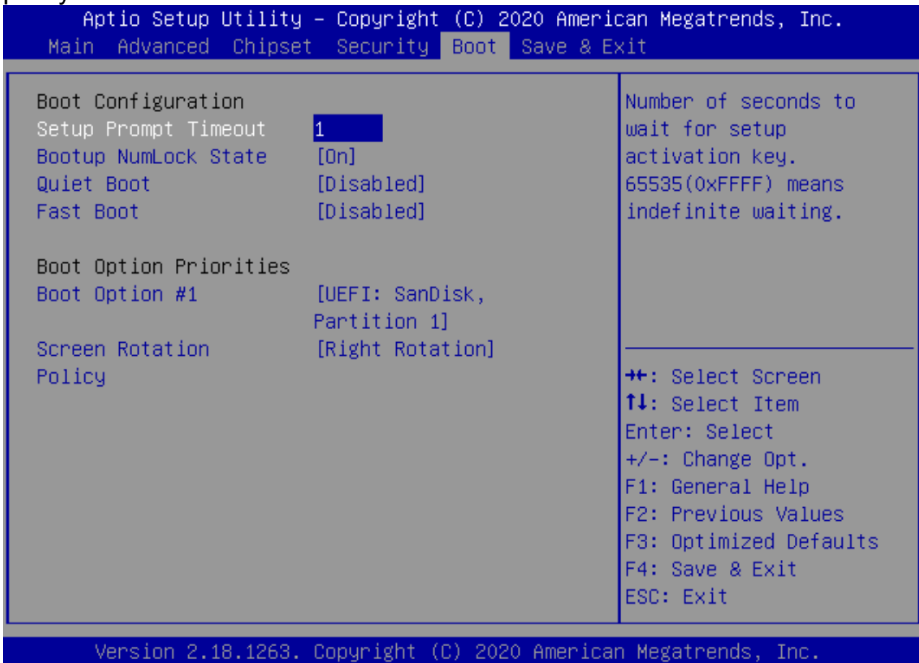
Remove an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the configured Administrator Password or User Password that you want to delete.
Leave the dialog box blank and press <Enter>.
3. Press <Enter> again when the password confirmation box appears.

5.1.6 Boot

Menu Path *Boot*

This menu provides control items for system boot configuration such as setting setup prompt timeout, enabling/disabling quiet boot and fast boot, changing the boot order from the available bootable device(s) and Screen Rotation policy.



Boot Menu Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric (from 1 to 65535)	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Selects the NumLock state after the system is powered on. <ul style="list-style-type: none"> • 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.

BIOS Setting	Options	Description/Purpose
Fast Boot	- Disabled - Enabled	Enables/Disables Fast Boot Options
Boot Option #1~#n	- [Drive(s)] - Disabled	Allows users to choose the priority of the boot devices listed in Hard Drive BBS Priorities.
Screen Rotation Policy	- Normal - Right Rotation (Default) - Left Rotation - Reversion	Controls the direction of screen display.

5.1.7 Save & Exit

Menu Path *Save & Exit*

The **Save & Exit** allows users to save or discard changed BIOS settings as well as load factory default settings.

Save Changed BIOS Settings

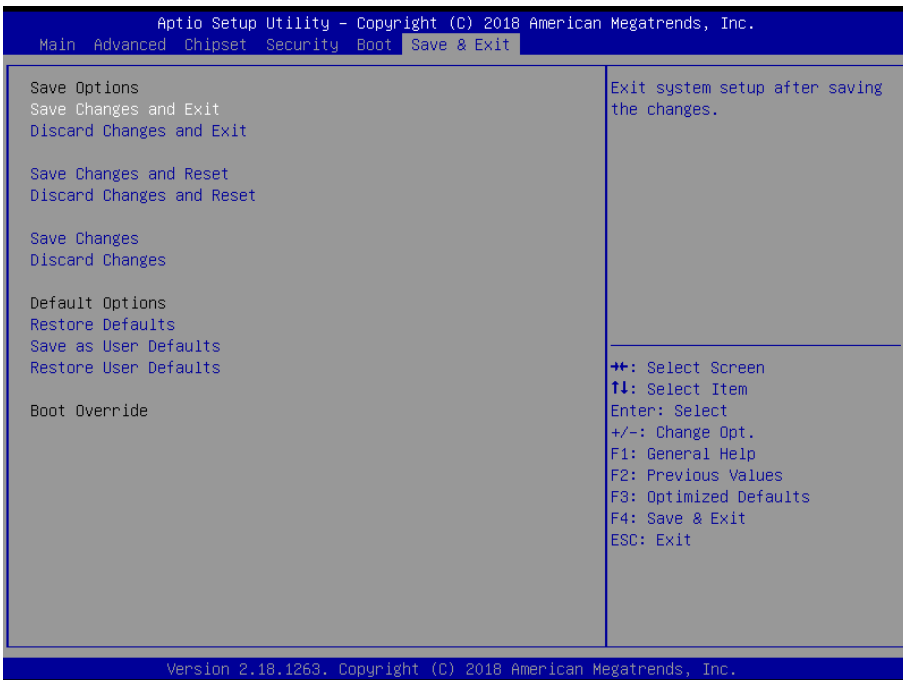
To save and validate the changed BIOS settings, select **Save Changes** from the **Save & Exit** menu, or you can select **Save Changes and Exit** (or press **F4**) to validate the changes and then exit the system. Select **Save Changes and Reset** to validate the changed BIOS settings and then restart the system

Discard Changed BIOS Settings

To cancel the BIOS settings you have previously configured, select **Discard Changes and Exit** from this menu, or simply press **Esc** to exit the BIOS setup. You can also select **Discard Changes and Reset** to discard any changes you have made and restore the factory BIOS defaults.

Load User Defaults

You may simply press **F3** at any time to load the **Optimized Values** which resets all BIOS settings to the factory defaults.



Save & Exit Menu Screen

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

Appendix A System Diagrams

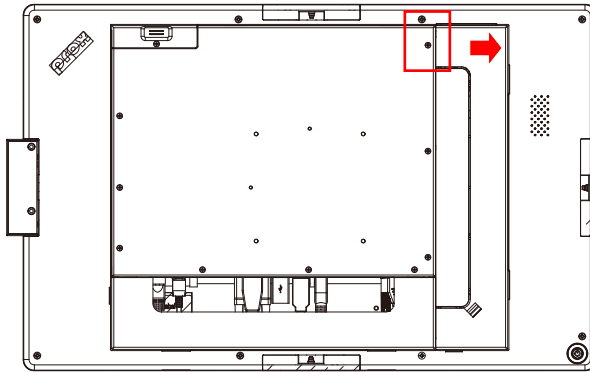
This appendix includes the easy maintenance and exploded diagrams of the system and the parts list as well as the part numbers of the PA-J600 system.

- Easy Maintenance
- Touch Panel Front Bezel Exploded Diagram
- LCD Panel Exploded Diagram
- PPC I/O Ports Cover Replacement Exploded Diagrams
- PB-5685 Main Board Exploded Diagram (Horizontal)
- PB-5685 Main Board Exploded Diagram (Vertical)
- HDD and Speaker Modules Exploded Diagram
- Heat Sink Exploded Diagram (Main Board PB-5685 / Horizontal)
- Heat Sink Exploded Diagram (Main Board PB-5685 / Vertical)
- Back Cover Exploded Diagram
- (Optional) Camera Module Assembly Exploded Diagram
- (Optional) Scanner Module Assembly Exploded Diagram

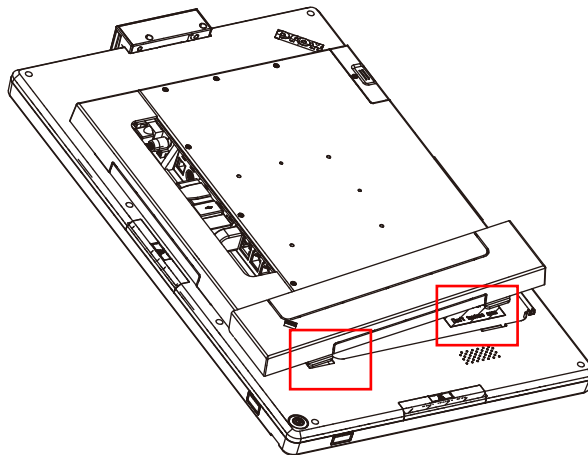
- (Optional) MSR & Fingerprint Modules Assembly Exploded Diagram (Horizontal)
- (Optional) MSR & Fingerprint Modules Assembly Exploded Diagram (Vertical)
- (Optional) I-Button Module Assembly Exploded Diagram (Horizontal)
- (Optional) I-Button Module Assembly Exploded Diagram (Vertical)
- (Optional) Wi-Fi / RFID Module Assembly Exploded Diagram
- (Optional) COM4 - I/O Expansion Plate (COM4, DC 24V, DC12V, Line Out, Mic)
- (Optional) USB - I/O Expansion Plate (USB x 2, DC 24V, DC12V, Line Out, Mic)

Easy Maintenance Removing PPC I/O Ports Covers

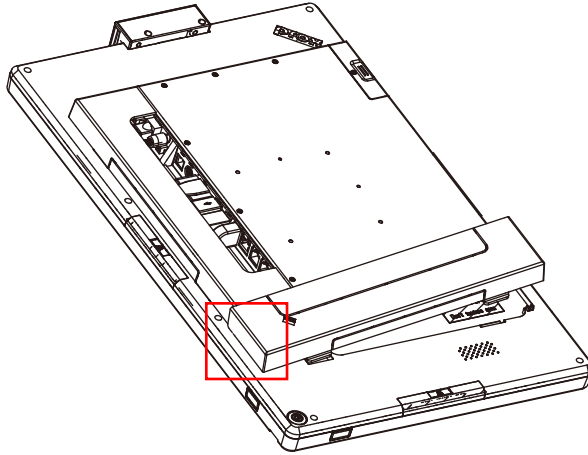
Step 1. Push the cable cover to the right and detach the right-side hook from the system.



Step 2. Detach the two cable hooks shown below:



Step 3. Turn the cable cover to the left to detach the left-side hook from the system. The cable cover can be then removed completely.

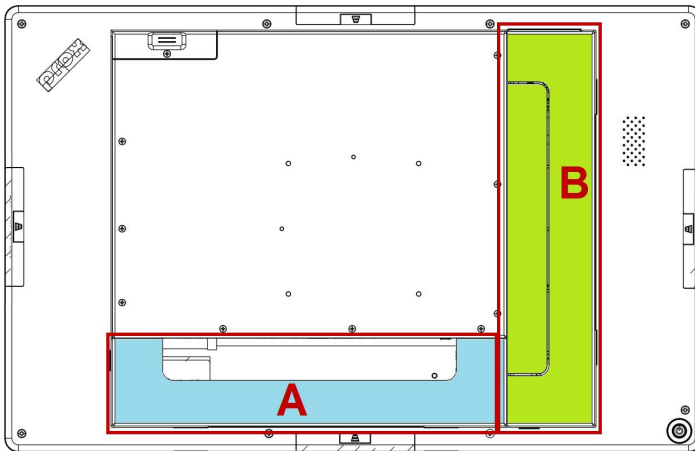


Adjusting Cable Covers Positions

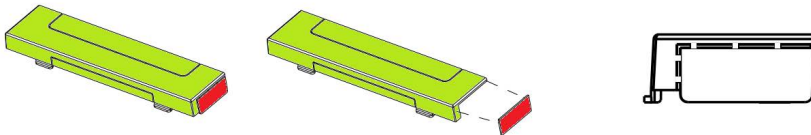
To change to view the PPC vertically, users should first adjust the positions of the cable covers located on the rear side of the system, and you can arrange to hide the connected cables properly. Follow the steps below to adjust the cable covers:

As shown below, at default, the cable cover marked as “A” indicates the cable cover installed on the bottom side of PPC. The cable cover marked as “B” indicates the cable cover on the right side of PPC.

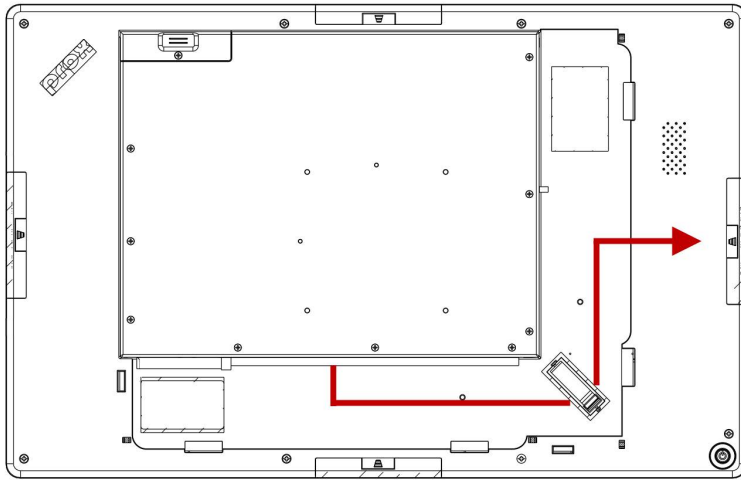
- Step 1.** Remove the two cable covers A and B. (Refer to the previous section: **Removing PPC I/O Ports Covers** section on how to remove a cable cover.)



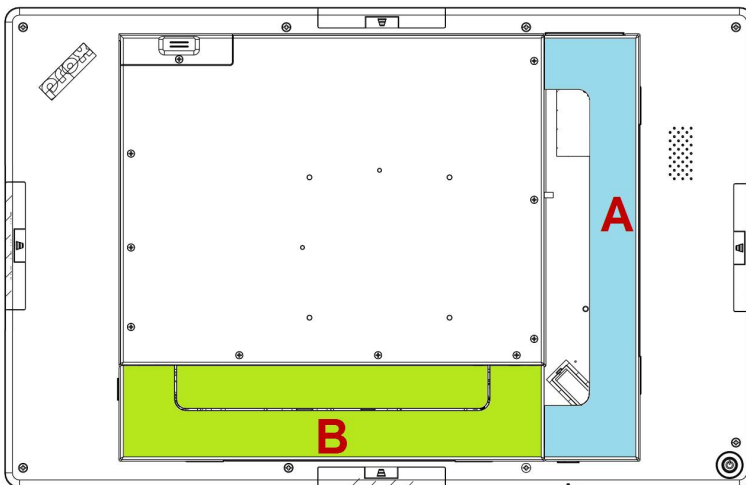
- Step 2.** Cut off 5 pins from the side cover (shown in red in the picture below) of the cable cover B as shown:



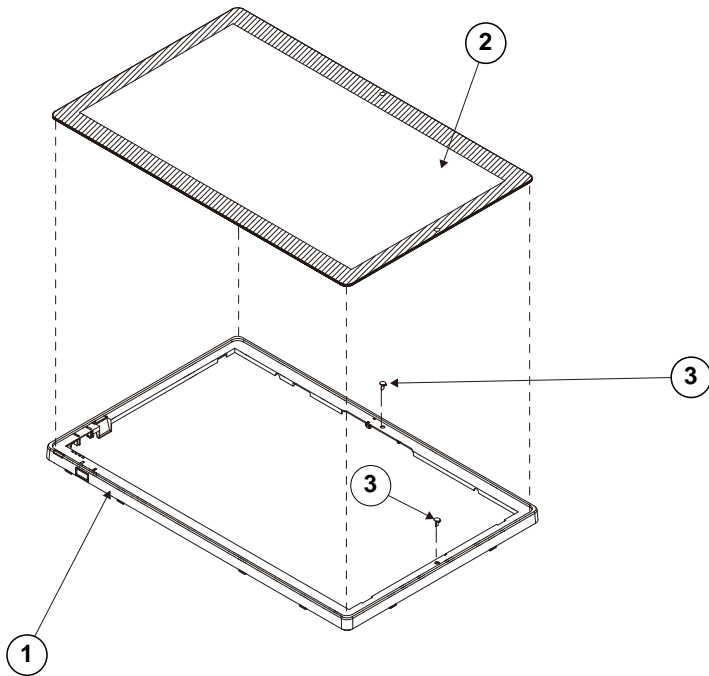
Step 3. Fix the connected cables with the cable tie as illustrated below:



Step 4. Install cable cover B into the original position of cable cover A, and vice versa to complete.

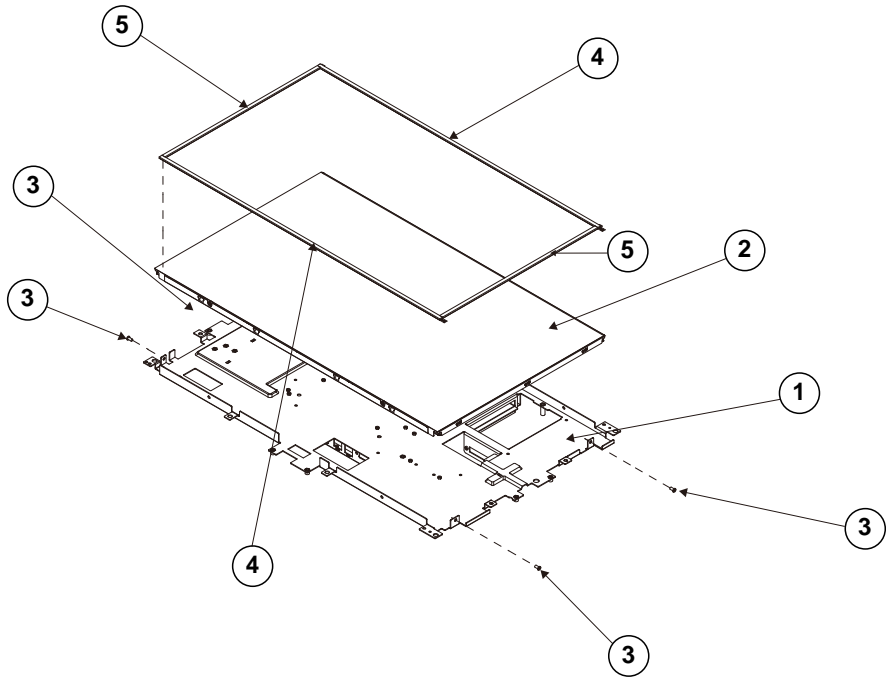


Touch Panel Front Bezel Exploded Diagram



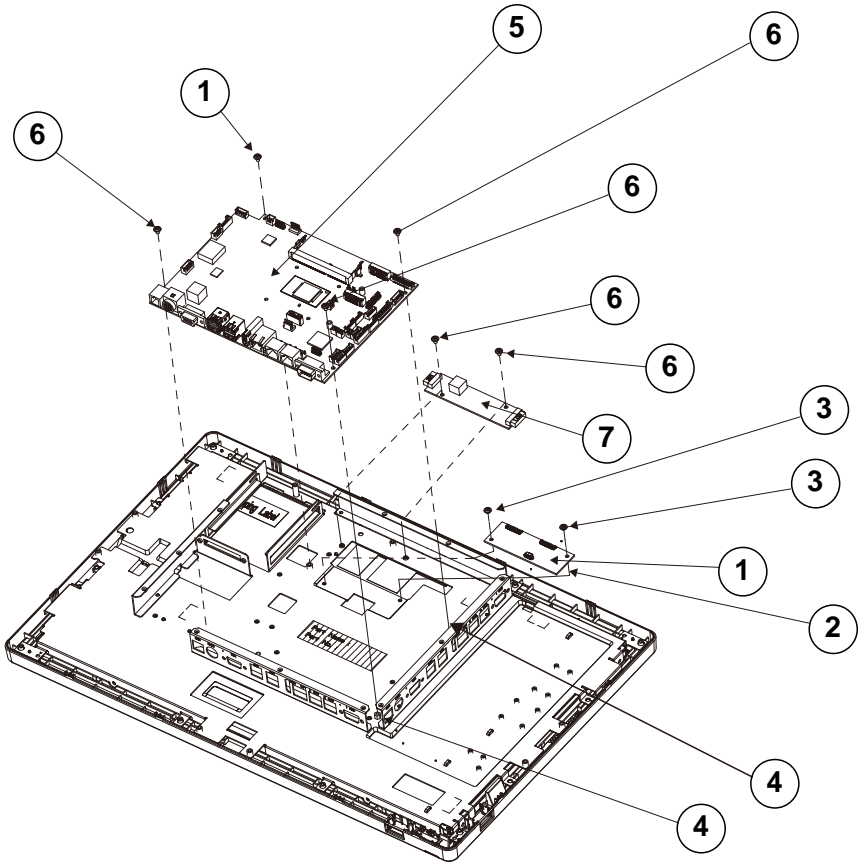
ITEM	Description	Part No.	Q'ty
1	PA-J600 ASSY LCD BEZEL(Black)	30-003-12210488	1
2	Touch Panel	N/A	1
3	PA-J600 MYLAR CAMERA(Black)	90-056-39100488	2

LCD Panel Exploded Diagram



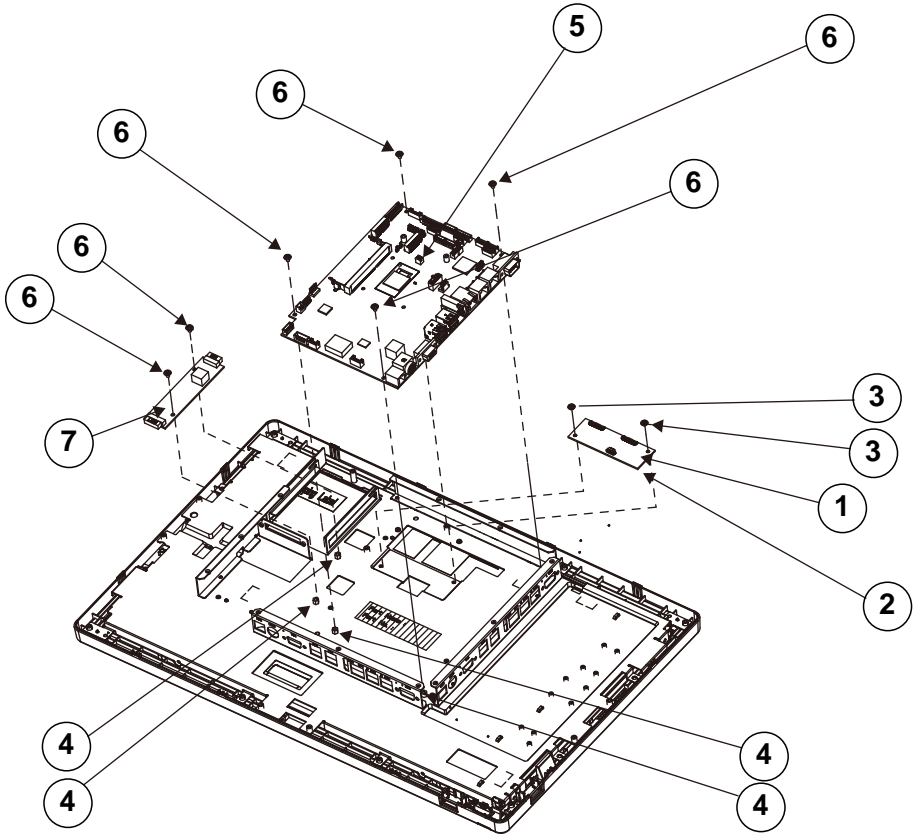
ITEM	Description	Part No.	Q'ty
1	PA-J600 TOP HOUSING PB-5685	80-042-03001488	1
2	LCD Panel	N/A	1
3	ROUND WASHER HEAD SCREW M3x0.5Px3mm	22-232-30003311	4
4	PA-J600 SPONGE PORON LCM L (489.8x5x2mm)	30-013-24200488	2
5	PA-J600 SPONGE PORON LCM S(271.3x5x2mm)	30-013-24300488	2

PB-5685 Main Board Exploded Diagram (Horizontal)



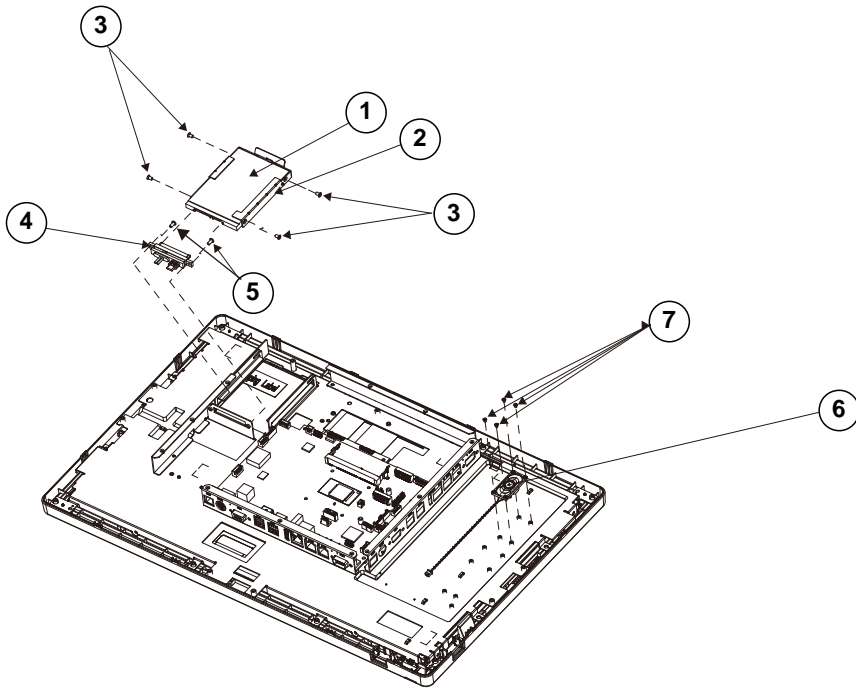
ITEM	Description	Part No.	Q'ty
1	Touch Control Board	N/A	1
2	Mylar for Touch controller	90-056-25600000	1
3	ROUND WASHER HEAD SCREWM3x0.5Px3mm	22-232-30003311	2
4	HEX CU BOSS M3x0.5Px3L,H=4.5mm	22-298-30005301	2
5	M/B	N/A	1
6	ROUND WASHER HEAD SCREWM3x0.5Px5mm	22-242-30005311	6
7	LED Driver Board	N/A	1

PB-5685 Main Board Exploded Diagram (Vertical)



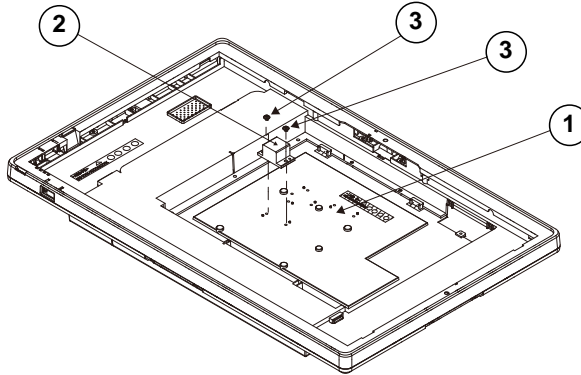
ITEM	Description	Part No.	Q'ty
1	Touch Control Board	N/A	1
2	Mylar for Touch controller	90-056-25600000	1
3	ROUND WASHER HEAD SCREWM3x0.5Px3mm	22-232-30003311	2
4	HEX CU BOSS M3x0.5Px3L,H=4.5mm	22-298-30005301	4
5	M/B	N/A	1
6	ROUND WASHER HEAD SCREWM3x0.5Px5mm	22-242-30005311	6
7	LED Driver Board	N/A	1

HDD and Speaker Modules Exploded Diagram



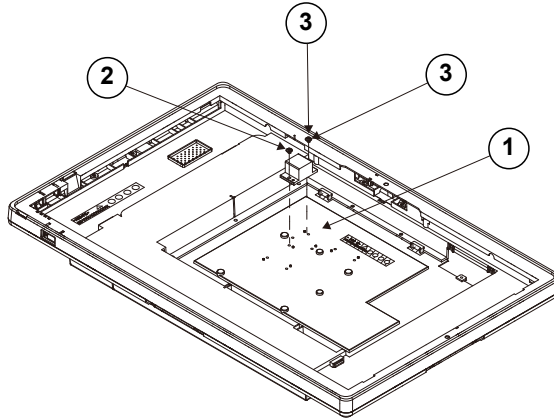
ITEM	Description	Part No.	Q'ty
1	HDD Bracket	N/A	1
2	PA-6222 HDD TRACK	20-039-03001335	1
3	ROUND WASHER HEAD SCREWM3x0.5Px5mm	22-242-30005311	4
4	SATA HDD & Power Lock Cable	N/A	1
5	FILLISTR HEAD SCREW #2 / M3x0.5Px6mm	82-275-30006018	2
6	Speaker	N/A	1
7	FILLISTR HEAD SCREW #1 / M2x0.4Px3mm	22-275-20003011	4

Heat Sink Exploded Diagram (Main Board PB-5685 / Horizontal)



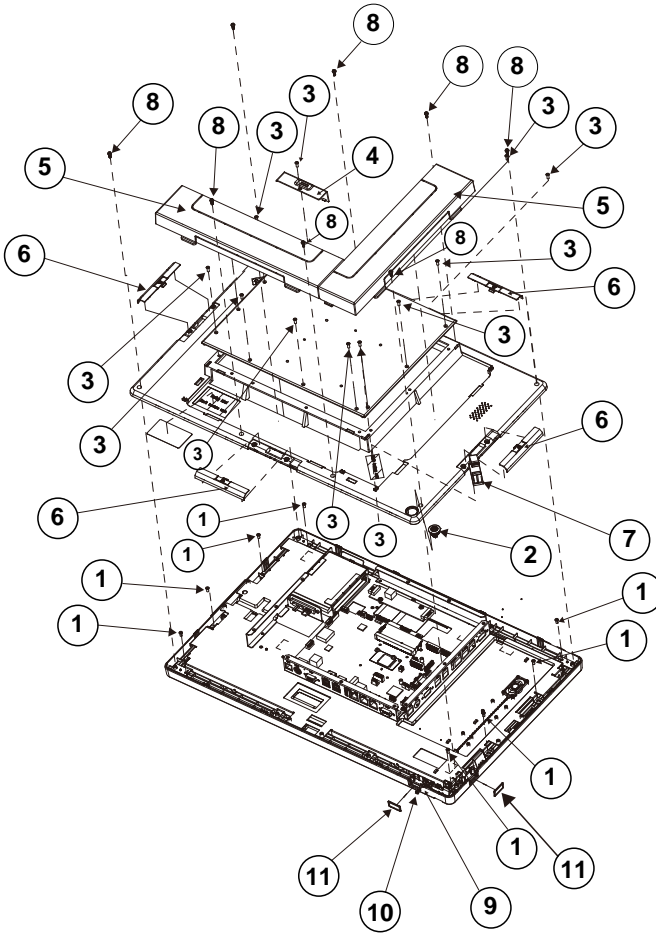
ITEM	Description	Part No.	Q'ty
1	PA-J600 PR HEAT SINK(w/Paint)(Black)	20-004-38061488	1
2	PA-J600 PR HEAT SINK BLOCK(37x21.3x17.9mm)	81-002-13721001	1
3	FILLISTR HEAD SCREW #2 / M3x0.5Px6mm	82-275-30006018	2

Heat Sink Exploded Diagram (Main Board PB-5685 / Vertical Touchscreen)



ITEM	Description	Part No.	Q'ty
1	PA-J600 PR HEAT SINK(w/Paint)(Black)	20-004-38061488	1
2	PA-J600 PR HEAT SINK BLOCK(37x21.3x17.9mm)	81-002-13721001	1
3	FILLISTR HEAD SCREW #2 / M3x0.5Px6mm	82-275-30006018	2

Back Cover Exploded Diagram

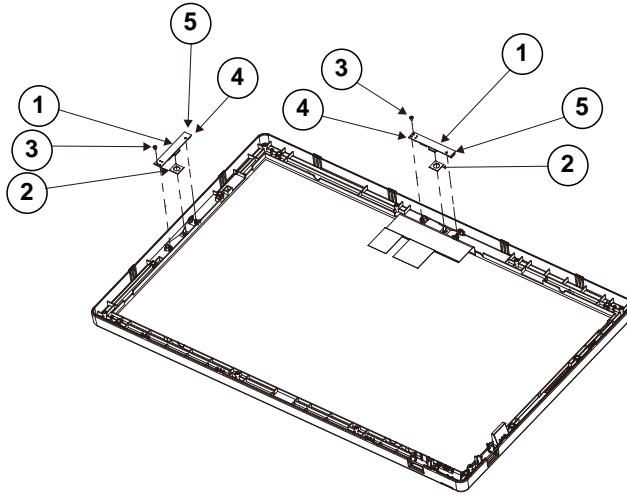


ITEM	Description	Part No.	Q'ty
1	FILLISTR HEAD SCREW #2 / M3x0.5Px6mm	82-275-30006018	8
2	Power Button	N/A	1
3	FLAT HEAD SCREW#2/ ϕ 5/M3x0.5Px8mm(Black)	22-215-30008011	11
4	PA-J600 PL COVER HEAT SINK (Black)	30-002-12310488	1
5	PA-J600 PL I/O COVER(Black)	30-002-12410488	2
6	PA-J600 PL SLIDE COVER(Black)	30-002-12510488	4

Appendix A System Diagrams

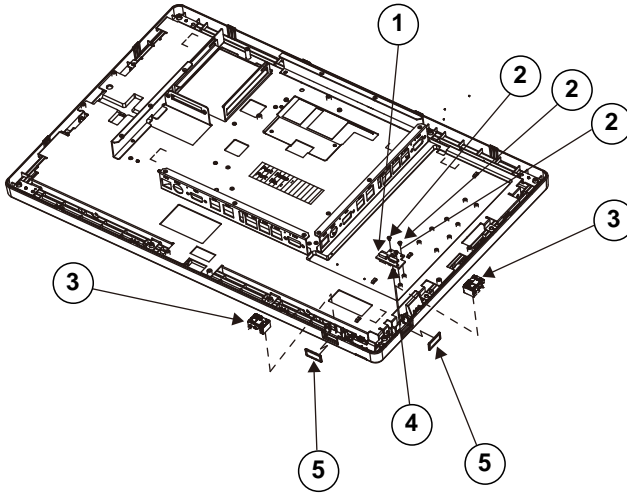
ITEM	Description	Part No.	Q'ty
7	Cable Tie	N/A	1
8	PAN HEAD SCREW #2 / T3.0x10mm(Black)	22-125-30010011	8
9	φ 3 LED Cable	N/A	1
10	PS-3100 LED HOUSING (Black)	30-014-04100165	1
11	MH-5100 BARCODE LENS(Black)	30-021-02330378	2

(Optional) Camera Module Assembly Exploded Diagram



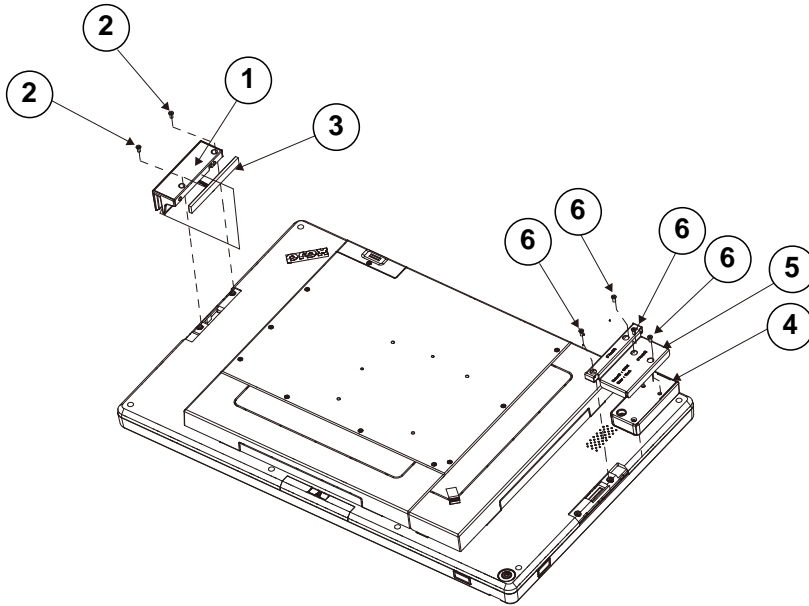
ITEM	Description	Part No.	Q'ty
1	Camera Module	N/A	1
2	PA-J600 SPONGE CAMERA	30-013-24100488	1
3	FILLISTR HEAD SCREW #1 / M2x0.4Px3mm	22-275-20003011	1
4	PA-5822 Conductive Copper Foil Tape (60x9x0.1mm)	30-050-52100407	1
5	Camera Cable	N/A	1

(Optional) Scanner Module Assembly Exploded Diagram



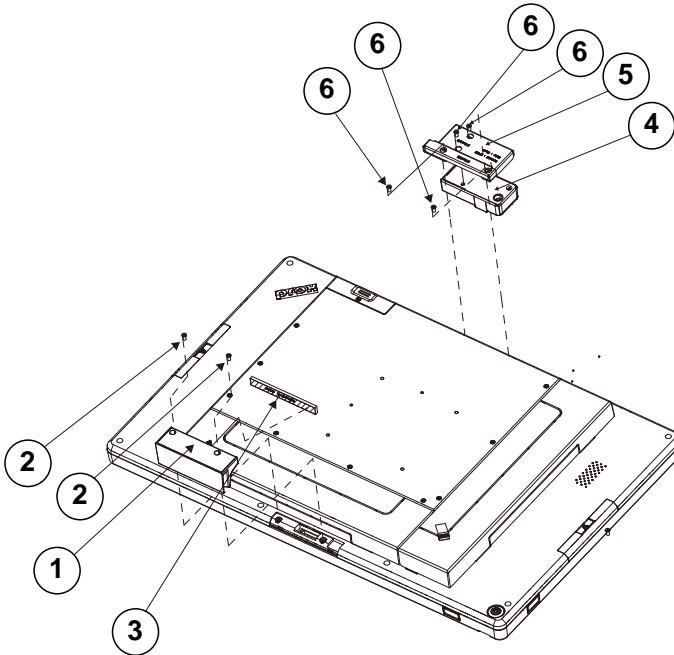
ITEM	Description	Part No.	Q'ty
1	DC/DC Converter Board for Scan Engine	N/A	1
2	FILLISTR HEAD SCREW #1 / M2x0.4Px3mm	22-275-20003011	3
3	2D Scan Engine	N/A	1
4	FFC	N/A	1
5	MH-5100 BARCODE LENS(Black)	30-021-02230378	1

(Optional) MSR & Fingerprint Modules Assembly Exploded Diagram (Horizontal)



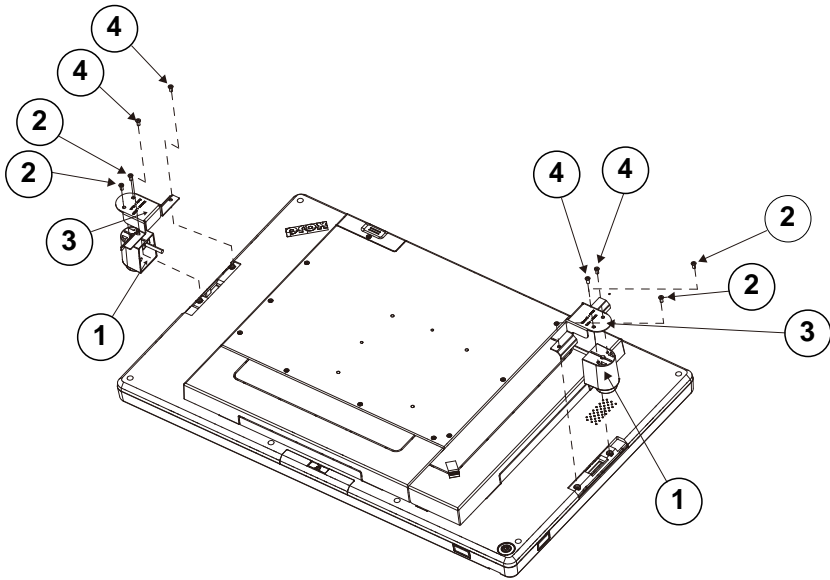
ITEM	Description	Part No.	Q'ty
1	MSR Module	N/A	1
2	FILLISTR HEAD SCREW#2 / M3x0.5Px6mm	82-275-30006018	2
3	PA-J600 MSR EVA (87x10x3.5mm)	N/A	1
4	Fingerprint module	N/A	1
5	PA-J600 PR BRT FINGER PRINTER (w/Paint) (Black)	20-206-03062488	1
6	FILLISTR HEAD SCREW#2 / M3x0.5Px6mm	82-275-30006018	4

(Optional) MSR & Fingerprint Modules Assembly Exploded Diagram (Vertical)



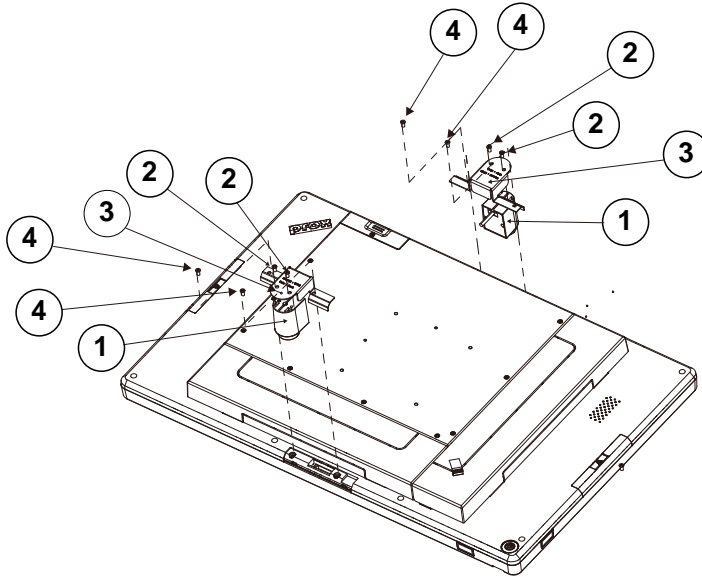
ITEM	Description	Part No.	Q'ty
1	MSR module	N/A	1
2	FILLISTR HEAD SCREW #2/M3x0.5Px6mm	82-275-30006018	2
3	PA-J600 MSR EVA (87x10x3.5mm)	N/A	1
4	Fingerprint module	N/A	1
5	PA-J600 PR BRT FINGER PRINTER (w/Paint) (Black)	20-206-03062488	1
6	FILLISTR HEAD SCREW #2/M3x0.5Px6mm	82-275-30006018	4

**(Optional) I-Button Module Assembly Exploded Diagram
(Horizontal)**



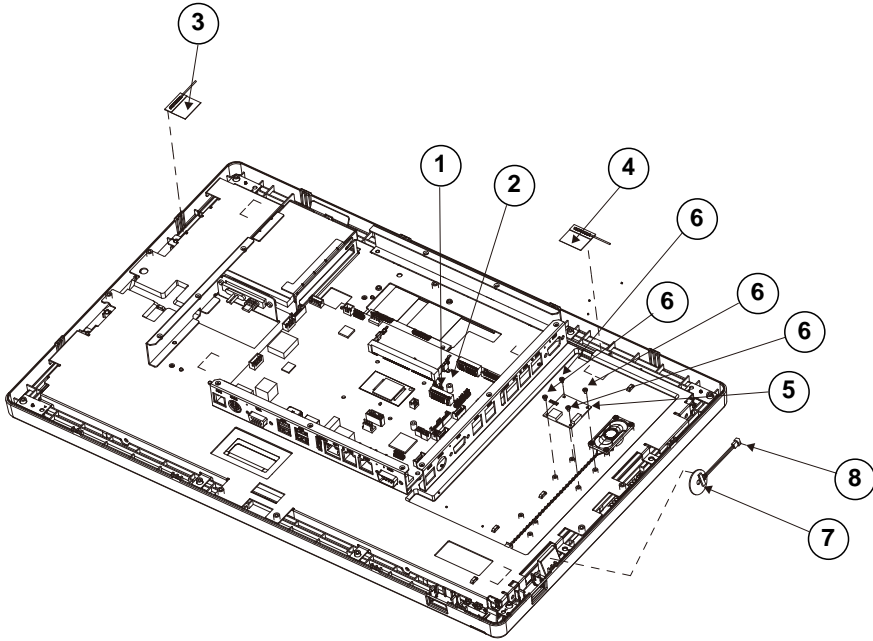
ITEM	Description	Part No.	Q'ty
1	IButton reader Module	N/A	1
2	FLAT HEAD SCREW #2 / M3x0.5Px4mm	22-215-30004311	2
3	PA-J600 PR BRACKET I BOTTON(w/Paint)(Black)	20-206-03061488	1
4	FILLISTR HEAD SCREW #2/M3x0.5Px6mm	82-275-30006018	2

**(Optional) I-Button Module Assembly Exploded Diagram
(Vertical)**



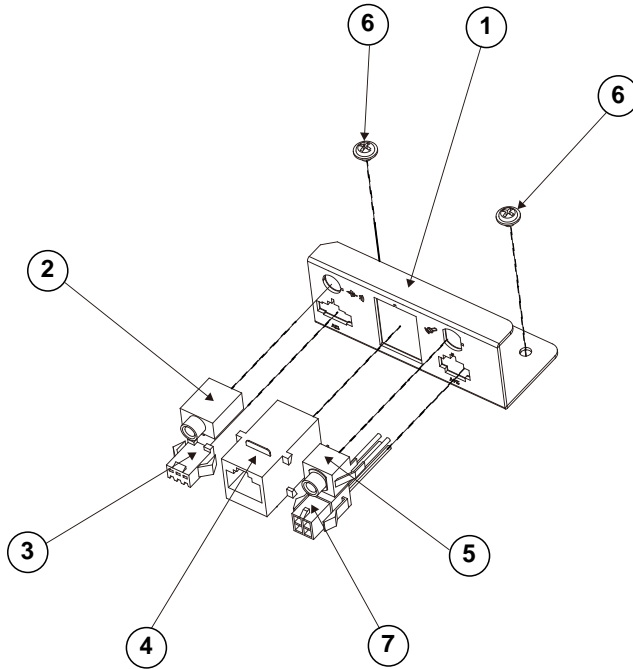
ITEM	Description	Part No.	Q'ty
1	MSR module	N/A	1
2	FLAT HEAD SCREW #2/M3x0.5Px4mm	22-215-30004311	2
3	PA-J600 PR BRACKET I BOTTON(w/Paint)(Black)	20-206-03061488	1
4	FILLISTR HEAD SCREW #2/M3x0.5Px6mm	82-275-30006018	2

(Optional) Wi-Fi / RFID Module Assembly Exploded Diagram



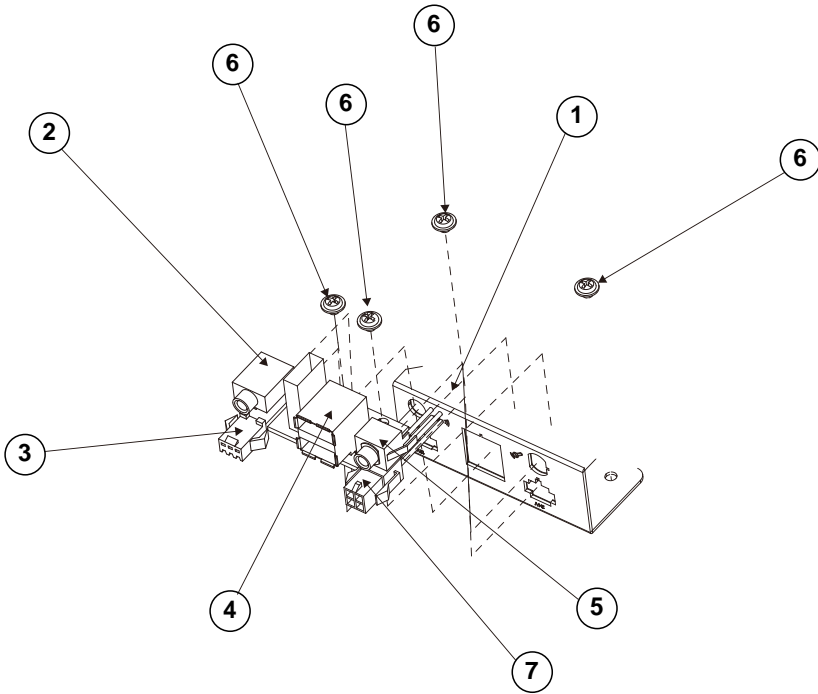
ITEM	Description	Part No.	Q'ty
1	Wi-Fi module	N/A	1
2	ROUND WASHER HEAD SCREW #1 / M2x0.4Px4mm	22-232-20004311	1
3	Wi-Fi Antenna L=475mm	27-029-48810071	1
4	MT-5750 2.4G/5G Antenna L=220mm	27-029-35505071	1
5	RFID PCB	N/A	1
6	FILLISTR HEAD SCREW #1/M2x0.4Px3mm	22-275-20003011	4
7	RFID module	N/A	1
8	RFID cable	N/A	1

(Optional) COM4 - I/O Expansion Plate (COM4, DC 24V, DC12V, Line Out, Mic)



ITEM	Description	Part No.	Q'ty
1	PA-J600 PR I/O BRACKET C-1 (COM4, DC 24V, DC 12V, Line Out, Mic)	20-206-03001488	1
2	Mic & LINE OUT CABLE	N/A	1
3	DC 12V CABLE	N/A	1
4	10P10C Modular Coupler	N/A	1
5	Mic & LINE OUT CABLE	N/A	1
6	ROUND WASHER HEAD SCREW M3x0.5Px3mm	22-232-30003311	2
7	DC 24V CABLE	N/A	1

(Optional) USB - I/O Expansion Plate (USB x 2, DC 24V, DC12V, Line Out, Mic)



ITEM	Description	Part No.	Q'ty
1	PA-J600 PR I/O BRACKET C-2 (USB x 2, DC 24V, DC 12V, Line Out, Mic)	20-206-03002488	1
2	Mic & LINE OUT CABLE	N/A	1
3	DC 12V CABLE	N/A	1
4	USB 2 ports USB BOARD	N/A	1
5	Mic & LINE OUT CABLE	N/A	1
6	ROUND WASHER HEAD SCREW M3x0.5Px3mm	22-232-30003311	4
7	DC 24V CABLE	N/A	1

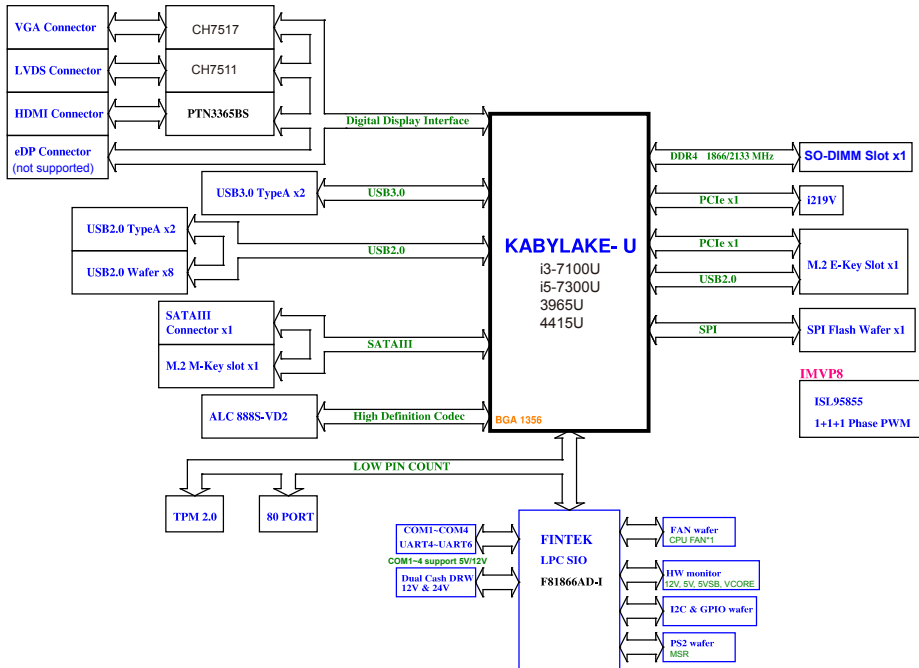
Appendix B Technical Summary

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

The following topics are included:

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

Block Diagram



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 6	Communications Port (COM4)
IRQ 7	Communications Port (COM3)
IRQ 8	System CMOS/real time clock
IRQ 10	Communications Port (COM5)
IRQ 11	Communications Port (COM6)
IRQ 11	Mobile Intel(R) Processor Family I/O SMBUS - 9D23
IRQ 11	Mobile Intel(R) Processor Family I/O Thermal subsystem - 9D31
IRQ 14	Motherboard resources
IRQ 16	Intel(R) Serial IO I2C Host Controller - 9D60
IRQ 16	High Definition Audio Controller
IRQ 20	Intel SD Host Controller
IRQ 20	Intel(R) Serial IO UART Host Controller - 9D27
IRQ 22	Intel SD Host Controller
IRQ 54	Microsoft ACPI-Compliant System
IRQ 55	Microsoft ACPI-Compliant System
IRQ 56	Microsoft ACPI-Compliant System
IRQ 57	Microsoft ACPI-Compliant System
IRQ 58	Microsoft ACPI-Compliant System
IRQ 59	Microsoft ACPI-Compliant System
IRQ 60	Microsoft ACPI-Compliant System
IRQ 61	Microsoft ACPI-Compliant System
IRQ 62	Microsoft ACPI-Compliant System

IRQ	Assignment
IRQ 63	Microsoft ACPI-Compliant System
IRQ 64	Microsoft ACPI-Compliant System
IRQ 65	Microsoft ACPI-Compliant System
IRQ 66	Microsoft ACPI-Compliant System
IRQ 67	Microsoft ACPI-Compliant System
IRQ 68	Microsoft ACPI-Compliant System
IRQ 69	Microsoft ACPI-Compliant System
IRQ 70	Microsoft ACPI-Compliant System
IRQ 71	Microsoft ACPI-Compliant System
IRQ 72	Microsoft ACPI-Compliant System
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IRQ	Assignment
IRQ 92	Microsoft ACPI-Compliant System
IRQ 93	Microsoft ACPI-Compliant System
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IRQ	Assignment
IRQ 121	Microsoft ACPI-Compliant System
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IRQ	Assignment
IRQ 150	Microsoft ACPI-Compliant System
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IRQ	Assignment
IRQ 179	Microsoft ACPI-Compliant System
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IRQ	Assignment
IRQ 259	Microsoft ACPI-Compliant System
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ	Assignment
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IRQ 510	Microsoft ACPI-Compliant System
IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967290	Intel(R) Management Engine Interface
IRQ 4294967291	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967292	Intel(R) HD Graphics 620
IRQ 4294967293	Intel(R) Ethernet Connection I219-V
IRQ 4294967294	Standard SATA AHCI Controller

Note: These resource information were gathered using Windows 10.

I/O MAP

I/O Map	Assignment
0x00000000-0x00000CF7	PCI Express Root Complex
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
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000A0-0x000000A1	Programmable interrupt controller

I/O Map	Assignment
0x000000A4-0x000000A5	Programmable interrupt controller
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
0x000002E0-0x000002E7	Communications Port (COM6)
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F0-0x000002F7	Communications Port (COM5)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003B0-0x000003BB	Intel(R) HD Graphics 620
0x000003C0-0x000003DF	Intel(R) HD Graphics 620
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000164E-0x0000164F	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x00001854-0x00001857	Motherboard resources

I/O Map	Assignment
0x0000F000-0x0000F03F	Intel(R) HD Graphics 620
0x0000F040-0x0000F05F	Mobile Intel(R) Processor Family I/O SMBUS - 9D23
0x0000F060-0x0000F07F	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000FF00-0x0000FFFE	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources

Memory Map

Memory Map	Assignment
0xDE000000-0xDEFFFFFF	Intel(R) HD Graphics 620
0xC0000000-0xCFFFFFFF	Intel(R) HD Graphics 620
0xFF000000-0xFFFFFFFF	Legacy device
0xFF000000-0xFFFFFFFF	Motherboard resources
0xFED10000-0xFED17FFF	Motherboard resources
0xFED18000-0xFED18FFF	Motherboard resources
0xFED19000-0xFED19FFF	Motherboard resources
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED20000-0xFED3FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFFFF	Motherboard resources
0xDFFE0000-0xDFFFFFFF	Motherboard resources
0xFE029000-0xFE029FFF	Motherboard resources
0xFE028000-0xFE028FFF	Motherboard resources
0xFDAF0000-0xFDAFFFFFFF	Motherboard resources
0xFDAE0000-0xFDAEFFFF	Motherboard resources
0xFDAC0000-0xFDACFFFF	Motherboard resources
0xDF04C000-0xDF04CFFF	Intel SD Host Controller
0xFE40F000-0xFE40FFFF	Intel(R) Serial IO UART Host Controller - 9D27
0xDF000000-0xDF01FFFF	Intel(R) Ethernet Connection I219-V
0xFED00000-0xFED003FF	High precision event timer
0xFD000000-0xFDABFFFF	Motherboard resources
0xFD000000-0xFDABFFFF	PCI Express Root Complex
0xFDAD0000-0xFDADFFFF	Motherboard resources
0xFDB00000-0xFDFFFFFFFF	Motherboard resources
0xFE000000-0xFE01FFFF	Motherboard resources

Memory Map	Assignment
0xFE036000-0xFE03BFFF	Motherboard resources
0xFE03D000-0xFE3FFFFF	Motherboard resources
0xFE410000-0xFE7FFFFF	Motherboard resources
0xDF04B000-0xDF04BFFF	Intel SD Host Controller
0xDF044000-0xDF047FFF	Mobile Intel(R) Processor Family I/O PMC - 9D21
0xFE40E000-0xFE40EFFF	Intel(R) Serial IO I2C Host Controller - 9D60
0xDF040000-0xDF043FFF	High Definition Audio Controller
0xDF020000-0xDF02FFFF	High Definition Audio Controller
0x90000000-0xDFFFFFFF	PCI Express Root Complex
0xFE40D000-0xFE40DFFF	Intel(R) Management Engine Interface
0xDF030000-0xDF03FFFF	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
0xDF04A000-0xDF04A0FF	Mobile Intel(R) Processor Family I/O SMBUS - 9D23
0xDF052000-0xDF052FFF	Mobile Intel(R) Processor Family I/O Thermal subsystem - 9D31
0xDF048000-0xDF049FFF	Standard SATA AHCI Controller
0xDF04F000-0xDF04F0FF	Standard SATA AHCI Controller
0xDF04E000-0xDF04E7FF	Standard SATA AHCI Controller
0xA0000-0xBFFFF	Intel(R) HD Graphics 620
0xA0000-0xBFFFF	PCI Express Root Complex

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 watch dog timer

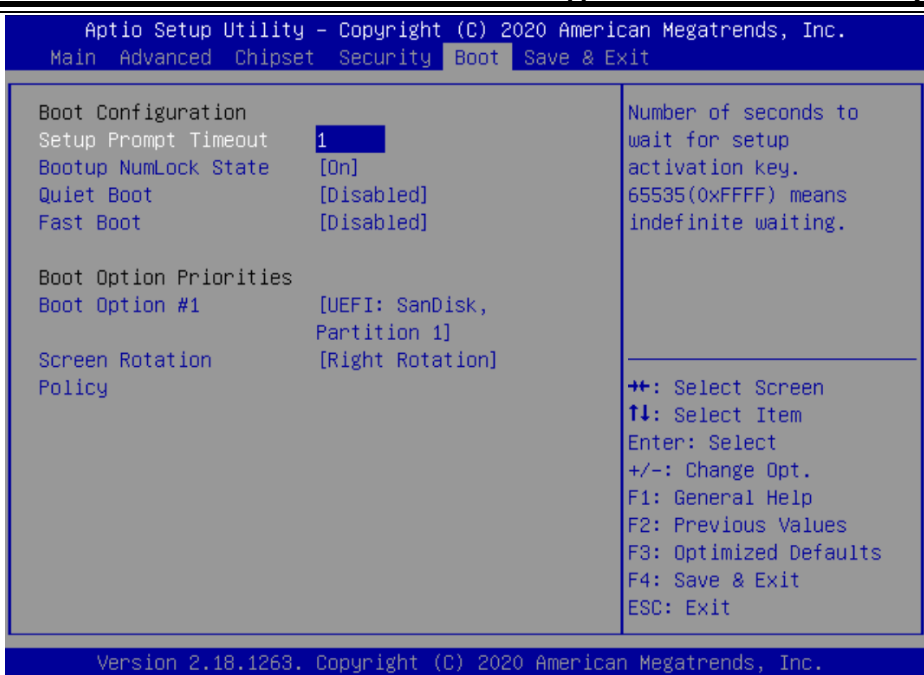
Enable watchdog timer and set timeout interval to 30 seconds.

```
;----- Enter to extended function mode -----  
mov    dx,    2eh  
mov    al,    87h  
out    dx,    al  
out    dx,    al  
;----- Select Logical Device 7 of watchdog timer -----  
mov    al,    07h  
out    dx,    al  
inc    dx  
mov    al,    07h  
out    dx,    al  
;----- Enable Watch dog feature -----  
mov    al,    030h  
out    dx,    al  
inc    dx  
mov    al,    01h  
out    dx,    al  
;----- Set timeout interval as 30 seconds -----  
dec    dx  
mov    al,    0F6h  
out    dx,    al  
inc    dx  
mov    al,    1Eh  
out    dx,    al  
;----- Enable Watch PME-----  
dec    dx  
mov    al,    0FAh  
out    dx,    al  
inc    dx  
in     al,    dx  
or     al,    51h  
out    dx,    al  
;----- Set second as counting unit and start counting -----  
dec    dx  
mov    al,    0F5h  
out    dx,    al  
inc    dx  
in     al,    dx  
and    al,    0F7h  
or     al,    20h  
out    dx,    al  
;----- Exit the extended function mode -----  
dec    dx  
mov    al,    0AAh  
out    dx,    al
```


Flash BIOS Update

I. Prerequisites

- 1** Prepare a bootable media (e.g. USB storage device) which can boot system to EFI Shell.
- 2** Download and save the BIOS file (e.g. J6000PU2.bin) to the storage device.
- 3** Copy AMI flash utility – AFUEFIx64.exe (v5.09.01) into the storage device. The utility and BIOS file should be saved to the same path.
- 4** Make sure the target system can first boot to the EFI shell environment.
 - (1) Connect the USB storage device.
 - (2) Turn on the computer and press <ESC> or key during boot to enter BIOS Setup.
 - (3) The system will go into the BIOS setup menu.
 - (4) Select [**Boot**] menu and set the USB storage device as the 1st boot device.
 - (5) Press <F4> key to save the configuration and restart the system to boot into EFI Shell environment.



II. AFUEFIx64 Command for System BIOS Update

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

AFUEFIx64 <ROM File Name> [option1] [option2]....

Users can type “AFUEFIx64 /?” to view the definition of each control option. 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 Boot into EFI Shell, change to the path where you put BIOS image and AFUEFIx64.

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

- 2 "AFUEFIx64 J6000Pxx.bin /p /b /n /x" and press enter to start the flash procedure. (xx means the BIOS revision part, e.g. U2...)
- 3 During the update procedure, you will see the BIOS update process status and its execution percentage. Beware! Do not turn off the system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and the system will be unable to boot up next time.
- 4 After the BIOS update procedure is completed, the following messages will be shown:

```
fs0:\afuefix64> AFUEFIx64 J6000PU2.bin /p /b /n /x  
+-----+  
|          AMI Firmware Update Utility v5.09.01.1317          |  
| Copyright (C) 1985-2019, American Megatrends International LLC. |  
| All Rights Reserved. Subject to AMI licensing agreement.      |  
+-----+  
Reading flash ..... done  
- ME Data Size Checking. ok  
- FFS checksums ..... ok  
- Check RomLayout ..... ok  
Erasing Boot Block ..... done  
Updating Boot Block ..... done  
Verifying Boot Block ..... done  
Erasing Main Block ..... done  
Updating Main Block ..... done  
Verifying Main Block ..... done  
Erasing NVRAM Block ..... done  
Updating NVRAM Block ..... done  
Verifying NVRAM Block ..... done  
fs0:\afuefix64>
```

- 5 Restart the system and boot up with the new BIOS configurations.
- 6 The BIOS Update is completed after the system is restarted.

- 7 Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.

