USER'S MANUAL

PA-6222

12" Waterproof True Flat Touch POS Terminal

Powered by Intel® Celeron® J1900 Quad-Core

PA-6222   M3

PA-6222
12" Waterproof True Flat Touch POS Terminal
Powered by Intel® Celeron® J1900 Quad-Core

COPYRIGHT NOTICE & TRADEMARK

DISCLAIMER

CE NOTICE

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.

TABLE OF CONTENTS

INTRODUCTION

This chapter gives you the information for the PA-6222. It also outlines the system specifications.

Sections included:

- About This Manual

- POS System Illustration

- System Specifications

- Safety precautions

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

1-1. ABOUT THIS MANUAL

Thank you for purchasing our PA-6222 Series System. The PA-6222 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-6222 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains four chapters. Users can configure the system according to their own needs.

Chapter 1 Introduction
This chapter introduces you to the background of this manual. It also includes illustrations and specifications for the whole system. The final section of this chapter indicates some safety reminders on how to take care of your system.

Chapter 2 System Configuration
This chapter outlines the location of motherboard, printer, VFD, MSR components and their function. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 3 Software
This chapter contains detailed information for driver installations of the Intel® Utility, VGA, LAN, Sound, Touch Screen, embedded peripheral devices, BIOS setup & update, Watchdog timer and resource map.

Chapter 4 System Diagrams
This chapter shows the exploded diagrams and part numbers of PA-6222 components.

1-2. POS SYSTEM ILLUSTRATION

Small stand type

Front View

Rear View

355
320
239
304
218

Top View

Side View

355
236
58
278
50°
215
236
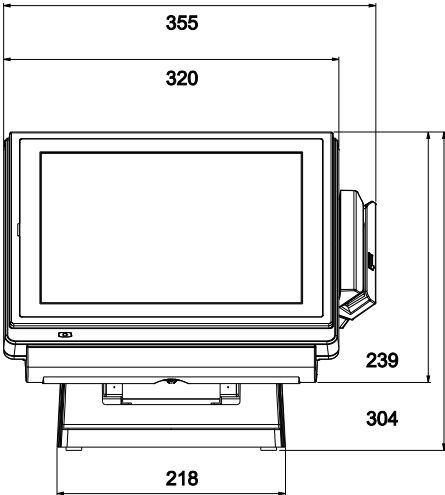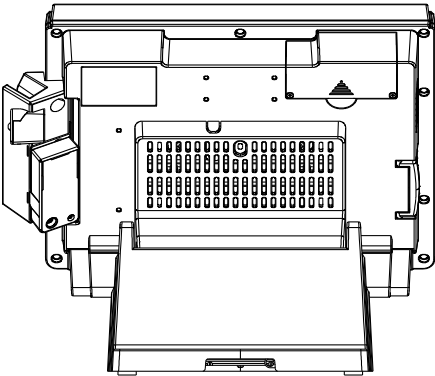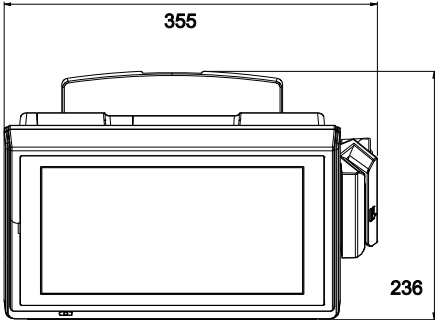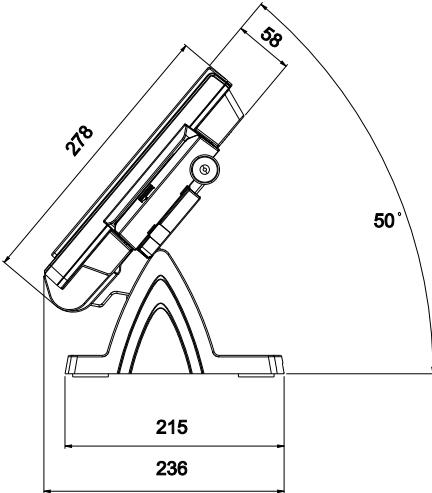
Unit: mm

Stand-less type

Front View   **Side View**

320

262

58
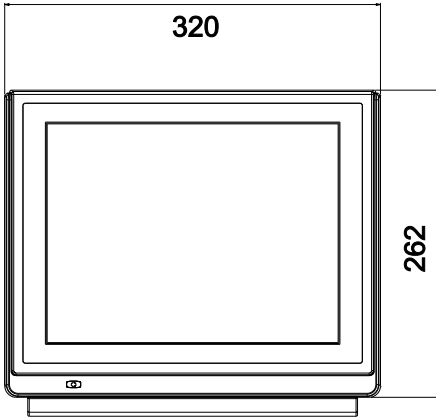
Unit: mm

1-3. SYSTEM SPECIFICATIONS

System

CPU	Intel® Celeron® J1900
Memory	DDR3L SO-DIMM(up to 8GB)
OS Support	・ Windows 8.1 ・ Windows POSReady7 ・ Windows 10 IoT Enterprise LTSB 2016
LAN	1 x RJ45
VGA	1 x DB-15
Wireless LAN (Optional)	802.11 b/g/n

AP distance	0˚	90˚	180˚	270˚
5M	-48 dB	-45 dB	-49 dB	-43 dB
10M	-46 dB	-50 dB	-52 dB	-50 dB

Note:

1. Test tolerance: ± 5dB
2. AP: ASUS RT-N56U (2 x internal antenna with 3.8 dBi gain)

Audio	2W speaker
System Weight	5kg, PPC only：3.2kg
Dimension (W x H x D)	320 x 303 x 236 mm
Network	10/100/1000M
Mounting Type	Support VESA 75/100
Line Out	1 x phone jack
Cash Drawer	1 x RJ11(+12/24V selectable)
DC-in	1 x 4pin DC Power Jack
Viewing Angel	24~30˚
Serial Ports	3 x RJ45, 1 x RJ45 optional(+5V/12V selectable)

72 W			
Power Supply: 72 Watt power adapter			
Power Consumption (AC):			

System Status	CPU/ HDD/ Memory	COM & USB Ports to supply power of Rear I/O	Consumption
OFF	Off	Without	1.6W
IDLE	Turns on, but not to execute extra AP		14.7W
Full Loading	100% loading of burn-in test		18.7W
		USB dummy load 500mA x4	29.5W

Certificate: CE/ FCC

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

Display

Customer Display	12" TFT LCD
	Resolution: 1024 x 768
Touchscreen	▪ Bezel-Free 5-wire resistive touch
Brightness	500 cd/m^2 LED Backlight

Environment

Temperature	▪ Operating: 0~35°C (32 ~ 95°F)
	▪ Storage: -5~60°C (-4 ~ 140°F)
Humidity	20~90%

Optional accessories

MSR & i-Button	JIS-I or II, ISO Track1+2+3
Fingerprint	8-bit grayscale reader
2nd Display	▪ 8" LCD or 10.4" LCD
Customer Display	VFD, 20 columns and 2 lines, each column is 5 x 7 dots

1-4. SAFETY PRECAUTIONS

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

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

2. Environmental Conditions
   a. Place your PA-6222 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   b. Avoid installing your PA-6222 Series POS system in extremely hot or cold places.
   c. Avoid exposure to sunlight for a long period of time (for example, in a closed car in summer time. Also avoid the system from any heating device.). Or do not use the PA-6222 when it has been left outdoors in a cold winter day.
   d. Bear in mind that the operating ambient temperature is between 0°C and 35°C (32°F and 95°F).
   e. Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
   f. Protect your PA-6222 against strong vibrations, which may cause hard disk failure.
   g. Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
   h. Always shutdown the operation system before turning off the power.

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

SYSTEM CONFIGURATION

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

Sections included:

● External I/O Port Pin Assignment

● How to Set Jumpers

● Component Locations & Jumper Settings
  - Mainboard
  - VFD Board (peripheral device)
  - MSR Board (peripheral device)

● Secondary Cash Drawer Port

2-1. SYSTEM EXTERNAL I/O PORT & PIN ASSIGNMENT

Rear I/O

Side I/O

Power   USB4
button
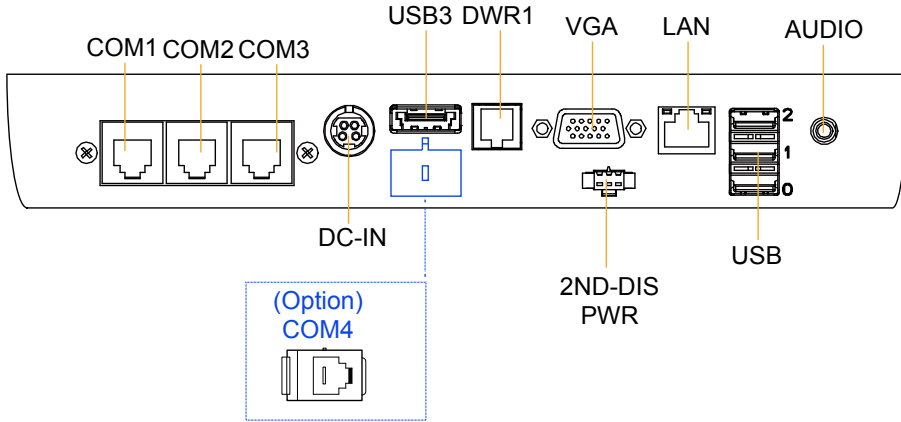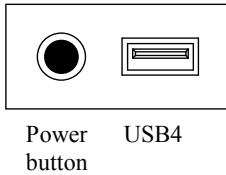
Power Button

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

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V

Power Button

DC-IN Port

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

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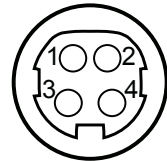
DC-IN

VGA Port

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

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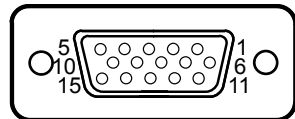
VGA

COM Port

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

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD1/2/3	6	DSR1/2/3
2	RXD1/2/3	7	RTS1/2/3
3	TXD1/2/3	8	CTS1/2/3
4	DTR1/2/3	9	RI/+5V/+12V selectable (Maximum current: 1A)
5	GND	10	NC
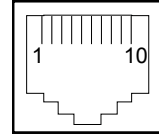
COM1/ COM2/ COM3

USB Port

USB0, USB1, USB2, USB3, USB4: USB Port Type A Ports
- USB0~3: Real I/O
- USB4: Side IO

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

USB0/ USB1/ USB2/ USB4
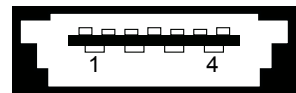
USB3

LAN Port

LAN: LAN RJ45 Port (rear IO)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MDI_0P	5	MDI_2N
2	MDI_0N	6	MDI_1N
3	MDI_1P	7	MDI_3P
4	MDI_2P	8	MDI_3N

Yellow   Green
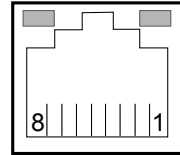
LAN

LAN LED Indicator:

Left Side LED

Yellow Color Blinking	LAN Message Active
Off	No LAN Message Active

Right Side LED

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

2nd Display Power Port (Optional)

2nd DIS PWR: DV12 Power Supply of 2nd Display

PIN	ASSIGNMENT
1	VCC12
2	GND
3	VCC12
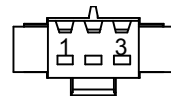
2ND DIS PWR

DC 24V Port (Optional)

DC 24V Port: DC24V power supply for the stand-printer

PIN	ASSIGNMENT
P1	GNDV
P2	+24V
P3	NA

DC 24V Port
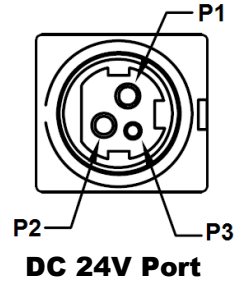
Cash Drawer Port

DRW1, DRW1-1, DRW1-2: Signal from M/B GPIO (rear I/O)

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

DRW1	Open		Close	
PB-6822RA, RB	**Write**	**To**	**Write**	**To**
	700h	588h	000h	588h
PB-6822RC	**Write**	**To**	**Write**	**To**
	02h	SIO LDN 06h's 90h	00h	SIO LDN 06h's 90h
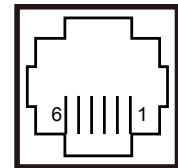
DRW1

2-2. MAINBOARD COMPONENT LOCATIONS & JUMPER SETTINGS

M/B: PB-6822
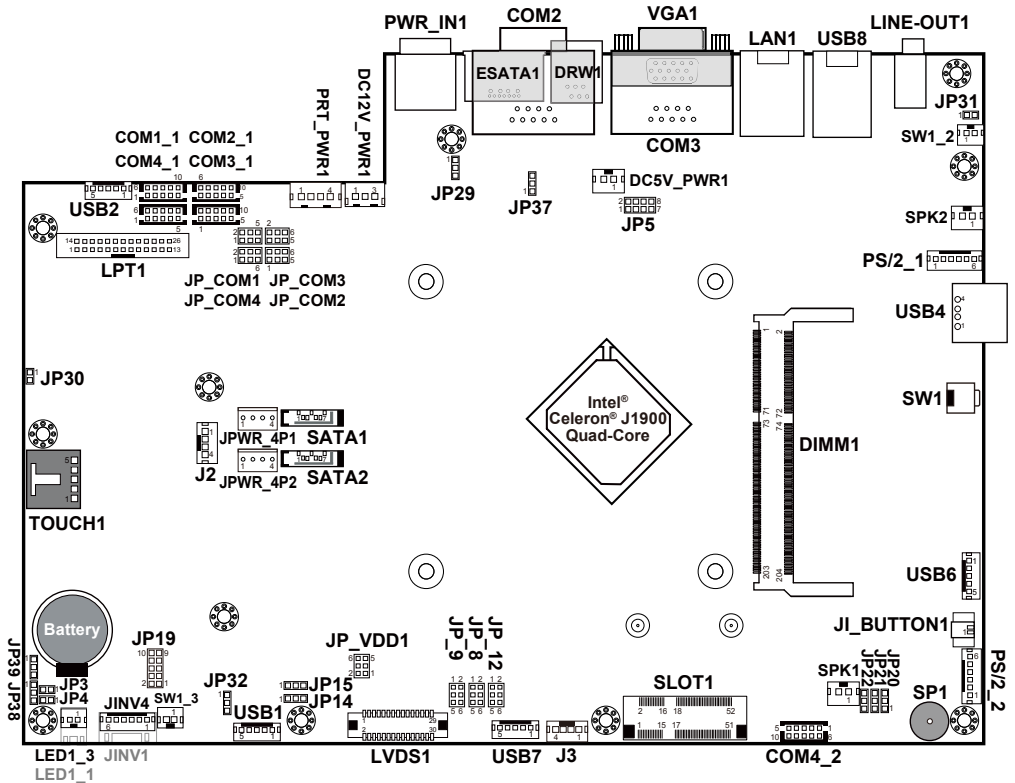
PB-6822 Mainboard Component Locations

2-2-1. 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

2 Pin Jumper	3 Pin Jumper	Jumper Block	Jumper Cap
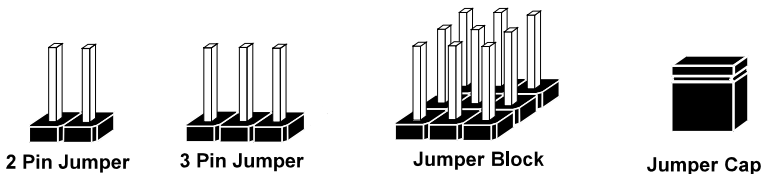
If a jumper has three pins for example, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

Jumper diagrams

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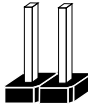
2 pin Jumper looks like this
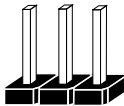
3 pin Jumper looks like this
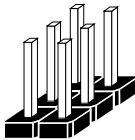
Jumper Block looks like this
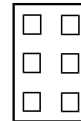
Jumper settings

2 pin Jumper closed(enabled)
looks like this

1
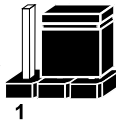
3 pin Jumper
2-3 pin closed(enabled)
looks like this
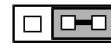
1
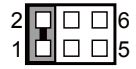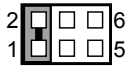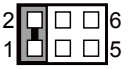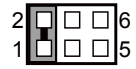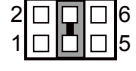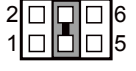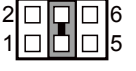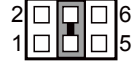
Jumper Block
1-2 pin closed(enabled)
looks like this
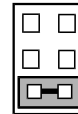
1 2

COM Port RI & Voltage Selection

JP_COM1, JP_COM2, JP_COM3, JP_COM4: Pin-headers on board

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION			
RI	1-2	JP_COM1	JP_COM2	JP_COM3	JP_COM4
+12V	3-4	JP_COM1	JP_COM2	JP_COM3	JP_ COM4
+5V	5-6	JP_COM1	JP_COM2	JP_COM3	JP_ COM4

Note: Manufacturing Default is no connection for JP_COM1, JP_COM2, JP_COM3 and JP_COM4.

Caution:

1. Voltage of external COM 1~ COM4 ports are made to control on BIOS for your convenience. The corresponding jumpers JP_COM1~ JP_COM4 are set open (no connection) by default; refer to *Voltage Adjust Configuration* for detailed jumper setting (BIOS default at RI).

2. JP_COM1~ JP_COM4 are enabled when COM1~ COM4 voltage adjustment is disabled on BIOS

3. Voltage of COM port is adjustable by BIOS or jumpers. Either way cannot be applied simultaneously in case of system error, component damage or serious boot failure.

PS: COM4 is optional

```
Advanced

COM1 select                    [Disabled]
COM2 select                    [Disabled]
COM3 select                    [Disabled]
COM4 select                    [Disabled]
Cash drawer                    [Cash drawer 12V]
```

COM Connector

COM1-1, COM2-1, COM3-1, COM4-1, COM4-2: COM Connectors

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

COM1-1/ COM2-1/ COM3-1/ COM4-1

COM4-2

Note: Each COM connector is selectable for RI/+5V/+12V.
For details, refer to *COM Port RI & Voltage Selection*.
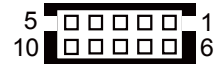
I-Button Connector

JI_BUTTON1: i-Button Connector

PIN	ASSIGNMENT
1	COM3_DTR_R_I
2	COM3_RXD_R_I
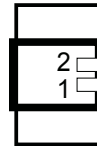
JI_BUTTON1

I-Button Function Selection

JP20, JP21, JP22: i-Button Function Connectors
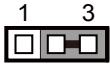
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
COM 3	1-2	**JP20/JP21/JP22/**
i-Button*	2-3	**JP20/JP21/JP22/**

Note: Manufacturing Default is COM3.

*COM3 & COM3-1 will not function when jumpers JP20, JP21 & JP22 are set as "i-Button."
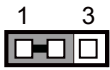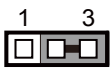
Cash Drawer Control Selection

JP37: DRW1 control connector

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
DRW1	2-3	1 3 **JP37**

Cash Drawer Power Selection

JP29: DRW1 power selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
+24V	1-2	1 3 **JP29**
+12V	2-3	1 3 **JP29**

Caution:
1. Voltage of external DRW1 port is made to control on BIOS for your convenience. The corresponding jumper JP29 is set open (no connection) by default.
2. JP29 is enabled when Cash drawer is disabled on BIOS.
3. Voltage of cash drawer port is adjustable by BIOS or jumpers. Either way cannot be applied simultaneously in case of system error, component damage or serious boot failure.

```
Aptio Setup Utility - Copyright (C) 2013 American
Advanced

COM1 Voltage select          [RI]
COM2 Voltage select          [RI]
COM3 Voltage select          [RI]
COM4 Voltage select          [RI]
Cash drawer                  [Cash drawer 12V]
```
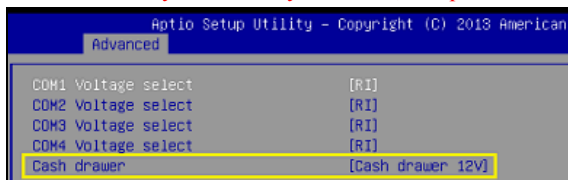
USB Connector

USB1, USB2, USB6, USB7: USB 2.0 connector

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

Note: USB1 would be used when jumpers
JP14 & JP15 are set as 1-2 (short)
connected.
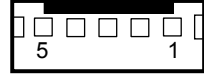
**USB1/
USB2/
USB7**
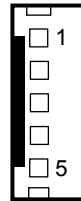
USB6

LED Connector

LED1_1, LED1_3: Power indication LED connector

PIN	ASSIGNMENT
1	GND
2	PWR_LED
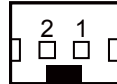
**LED1_1/
LED1_3**

Power Connector

DC12V_PWR1: DC 12Voltage Provider Connector

PIN	ASSIGNMENT
1	VCC12
2	GND
3	VCC12

DC12V_PWR1
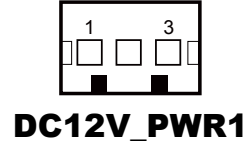
DC5V_PWR1: DC 5Voltage Provider Connector

PIN	ASSIGNMENT
1	5V
2	GND

DC5V_PWR1
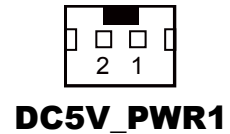
Power for Thermal Printer Connector

PRT_PWR1: Power for Thermal Printer Connector

PIN	ASSIGNMENT
1	VCC24SB
2	VCC24SB
3	GND
4	GND

PRT_PWR1
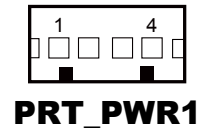
External Speaker Connector

SPK1, SPK2: External speaker connector

PIN	ASSIGNMENT
1	SPK_GND
2	SPK_OUT
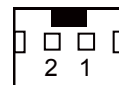
SPK1/

SPK2

Inverter Connector

JINV1, JINV4: Inverter connectors

PIN	ASSIGNMENT
1	+12V
2	+12V
3	GND
4	BRCTR
5	GND
6	LVDS_BKLTEN
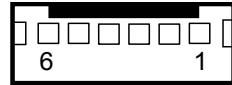
JINV1/ JINV4

LED Backlight Power Control Selection
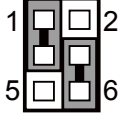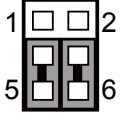
JP12: LED backlight power control connectors

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Control by driver on M/B	1-3, 2-3 It applied to the panel without driver built-in	**JP12**
Control by PWM	3-5, 4-6 It applied to the panel with built-in driver inside	**JP12**

Note: Manufacturing Default is Control by PWM.

Panel Resolution Selection

JP8, JP9: Panel resolution control connectors

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
1024 x 768 (24 bit)	JP8: 1-3, 4-6 JP9: 3-5, 4-6	**JP8**	**JP9**

Note: Manufacturing Default is 1024 x 768 (24bit).

LVDS Connector

LVDS1: LVDS Connector

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

LVDS1
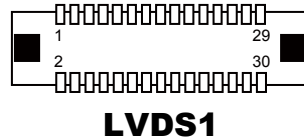
Touch Panel Connector

TOUCH1: Touch panel connectors

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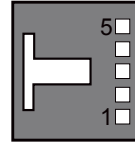
TOUCH1

Touch Panel Signal Interface Selection

JP14, JP15, JP38, JP39: Control connectors for touch panel signal interface

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION			
USB1 Connector	JP14: 1-2 JP15: 1-2 JP38: 2-3 JP39: 2-3	JP14	JP15	JP38	JP39
USB Interface	JP14: 2-3 JP15: 2-3 JP38: 2-3 JP39: 2-3	JP14	JP15	JP38	JP39
RS-232 Interface	JP14: 1-2 JP15: 1-2 JP38: 1-2 JP39: 1-2	JP14	JP15	JP38	JP39

Note: 1. Manufacturing Default is USB Interface.

   2. The COM2 & COM2-1 connector will not function when JP38 & JP39 are set as 1-2 connected.

   3. USB1 connector when JP14 & JP15 are set as 1-2 connected.

Clear CMOS Data Selection

JP3: Clear CMOS data selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	Open	1 JP3
Clear CMOS*	1-2	1 JP3

Note: Manufacturing Default is Normal.

*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.

MSR/Card Reader Connector

PS/2_1, PS/2_2: MSR/Card reader connectors

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

1   6

PS/2_1

6

1
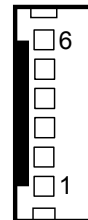
PS/2_2

SATA & SATA Power Connector

SATA1, SATA2: Serial ATA connectors

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

SATA1/ SATA2

Note: SATA1 only supports the optional RAID function on board.

JPWR_4P1, JPWR_4P2: Serial ATA power connectors

PIN	ASSIGNMENT
1	VCC
2	GND
3	GND
4	VCC12
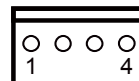
JPWR_4P1/ JPWR_4P2

Note: JPWR_4P1 only supports the optional RAID function on board.

Printer Connector

```
14□ □ □ □ □ □ □ □ □ □ □ □ □ □26
 1□ □ □ □ □ □ □ □ □ □ □ □ □13
```
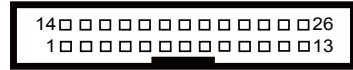
LPT1

LPT1: Printer connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STBJ	14	ALFJ
2	PDR0	15	ERRJ
3	PDR1	16	PAR_INITJ
4	PDR2	17	SLCTINJ
5	PDR3	18	GND
6	PDR4	19	GND
7	PDR5	20	GND
8	PDR6	21	GND
9	PDR7	22	GND
10	ACKJ	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCTJ	26	NC

Mini-PCIe / mSATA Connector

SLOT1: Mini-PCIe connector, not support USB function

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE#	27	GND
2	+3.3V	28	+1.5V
3	Reserved	29	GND
4	GND	30	SMB_CLK
5	Reserved	31	PETn2
6	+1.5V	32	SMB_DATA
7	CLKREQ#	33	PETp2
8	Reserved	34	GND
9	GND	35	GND
10	Reserved	36	NC
11	REFCLK1-	37	GND
12	Reserved	38	NC
13	REFCLK1+	39	+3.3V
14	Reserved	40	GND
15	GND	41	+3.3V
16	Reserved	42	Reserved
17	Reserved	43	GND
18	GND	44	Reserved
19	Reserved	45	NC
20	Reserved	46	Reserved
21	GND	47	NC
22	PERST#	48	+1.5V
23	PERn2	49	NC
24	+3.3SB	50	GND
25	PERp2	51	Reserved
26	GND	52	+3.3V
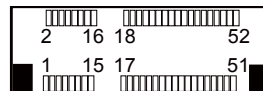
SLOT1

2-3. VFD BOARD COMPONENT LOCATIONS & PIN ASSIGNMENT
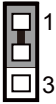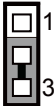
VFD Board: MB-4103, LD720
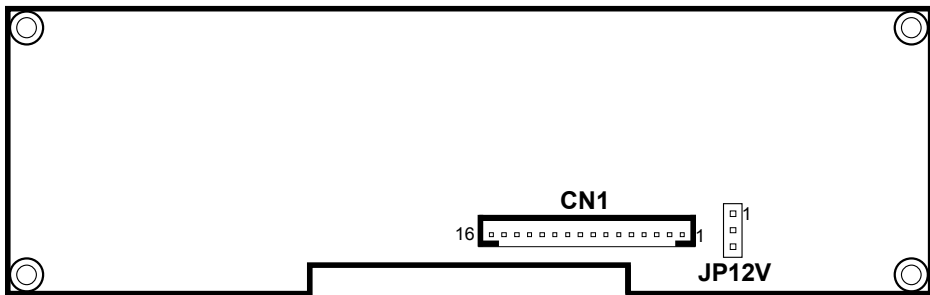
MB-4103 & LD720 VFD Board Component Locations

Power Switch Selection

JP12V: Power Switch Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
OFF	1-2	JP12V
ON	2-3	JP12V

Note: Manufacturing Default is ON.

RS-232 Serial Interface Connector

CN1: RS-232 serial interface wafer

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

16   1

CN1
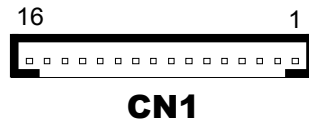
2-4. MSR BOARD COMPONENT LOCATIONS & PIN ASSIGNMENT

ID TECH

ID-TECH MSR Board Component Locations

Main Connector

CN:

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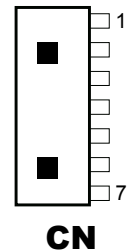
MB-3012

MB-3012 MSR Board Component Locations

Information Button Reader

I_BUTTON1: Information button reader

PIN	ASSIGNMENT
1	I_B1
2	GND
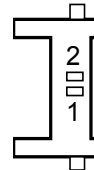
I_BUTTON1

Output Connector

IO1: Output wafer

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CLK_KB	7	RX_MSR
2	CLK_PC	8	TX_MSR
3	DATA_KB	9	GND
4	DATA_PC	10	USB_D+_R
5	+5V	11	USB_D-_R
6	CHASSIS GND	12	GND
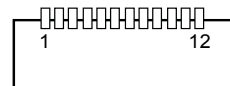
IO1

2-5. Secondary Cash Drawer

2-5-1. DRW1-2 Port (Only for PA-6222RC)
DRW1 is used by default. If you need a second port, adopt either way below.

Step.1
DRW1 includes two groups of GPIO pins. The second group is normally unused but can be enabled by the jumper.
Set the pin-header jumper JP37 as 1-2 connected if necessary.

JP37: DRW1-2 control connector
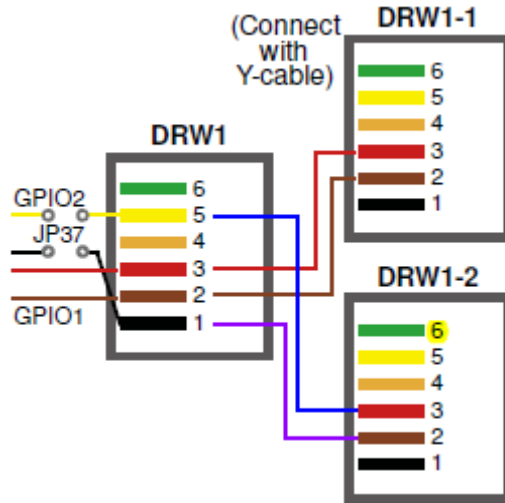
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
DRW1-2 Open	1-2	JP37
GND	2-3	JP37

Note: Manufacturing Default is GND.

Step.2

You can split DRW1 into two channels of DRW1-1 & DRW1-2 with the Y-Cable
(optional unit).
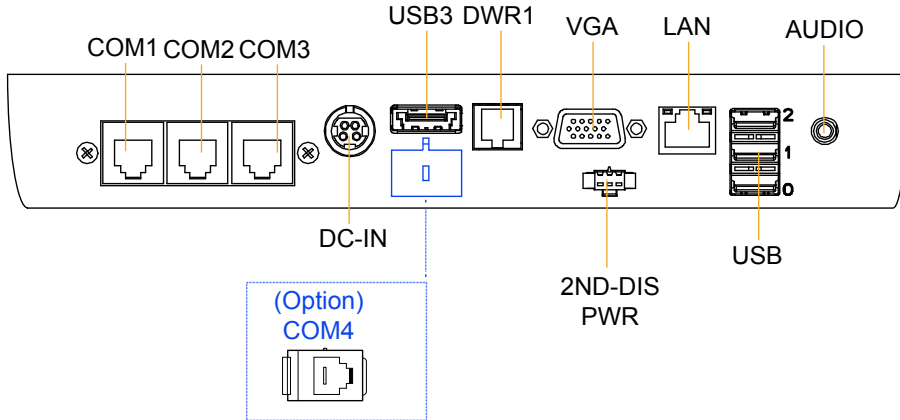
Step.3

DRW1, DRW1-1, DRW1-2 shares the same power source
(refer to Cash Drawer Power Selection for adjustment, default at 12V).

DRW1, DRW1-1, DRW1-2: Signal from M/B GPIO (rear I/O)

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

DRW1-1	Open		Close	
PB-6822RA, RB	Write	To	Write	To
	700h	588h	000h	588h
PB-6822RC	Write	To	Write	To
	02h	SIO LDN06h's 90h	00h	SIO LDN 06h's 90h
DRW1-2	OPEN		CLOSE	
PB-6822RA, RB	Write	To	Write	To
	N/A	N/A	N/A	N/A
PB-6822RC	Write	To	Write	To
	04h	SIO LDN 06h's 90h	00h	SIO LDN 06h's 90h

SOFTWARE

This chapter provides the detailed information of driver utilities and BIOS settings for the system.

Sections included:

- Driver
  - Intel® Chipset Device Software Installation Utility
  - VGA Driver Utility
  - LAN Driver Utility
  - Sound Driver Utility
  - Touchscreen Driver Utility
  - For Intel Trusted Execution Engine Interface

- Embedded Peripheral Device
  - VFD
  - MSR

- API

- BIOS Operation
  - Setup
  - Watchdog Timer Configuration
  - Update Procedure
  - System Resource Map

3-1. DRIVER

3-1-1. Introduction

Enclosed with the PA-6222 Series package is our driver utilities which comes in a DVD-ROM format.

3-1-1-1. API Package Folder

Refer to the "3-3 API" for the details.
+--->\DEMO PROJECT\
+--->\ProxAPI standard\
+--->\Document\

3-1-1-2. Driver Folder
1. The sequence of setup is "Main Chip -> VGA -> LAN -> SOUND -> TXE -> TOUCH[Device folder]"
2. You will be prompted to reboot when installation is complete.
+--->\Flash BIOS\AFUa.bat
+--->\Plaform\
+--->\Device\

3-1-1-3. User Manual Folder
\AdbeRdr930_en_US.exe (PDF File reader)

3-1-1-4. README
The DRIVER DISC introduction

3-1-2. Intel® Chipset Device Software Installation Utility

3-1-2-1. Introduction

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

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

3-1-2-2. Installation of Intel® Chipset Driver

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

1. Connect the USB CD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Main Chip" folder where the Chipset driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-3. VGA Driver Utility

The VGA interface embedded with PA-6222 can support a wide range of display types. You can have dual displays via CRT & LVDS interfaces work simultaneously.

3-1-3-1. Installation of VGA Driver

To install the Graphics driver, follow the steps below:

1. Connect the USB-CD ROM device to PA-6222 and insert the driver disk.
2. Enter the "Graphics" folder where the VGA driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-4. LAN Driver Utility

PA-6222 is enhanced with LAN function that can support various network adapters. Installation platform for the LAN driver is listed as follows:

3-1-4-1. Installation of LAN Driver

To install the LAN Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "LAN Chip" folder where the LAN driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

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

3-1-5. Sound Driver Utility

The sound function enhanced in this system is fully compatible with Windows POSReady 7 & Windows 8 & Windows 10 series. Below, you will find the content of the Sound driver.

3-1-5-1. Installation of Sound Driver

To install the Sound Driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Sound Codec" folder where the sound driver is located (depending on your OS platform).
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-6. Touchscreen Driver Utility

The touchscreen driver utility can only be installed on Windows POSReady 7 & Windows 8 & Windows 10 series, and it should be installed right after the OS installation.

3-1-6-1. Installation of Touchscreen Driver

To install the touchscreen driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Device\Touch Controller" folder where the touchscreen driver is located.
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-7. Fingerprint Driver Utility (Optional)

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

3-1-7-1. Installation of Fingerprint Driver

To install the fingerprint driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Device\Embedded Fingerprint" folder where the fingerprint driver is located.
3. Click **Setup.exe** file for driver installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-8. RFID Module Driver Utility (Optional)

The RFID driver utility can only be installed on Windows POSReady7 & Windows 8 & Windows 10 series, and it should be installed right after the OS installation.

3-1-8-1. Installation of RFID Module Driver

To install the RFID driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Device\RFID" folder where the RFID Module driver is located.
3. Click **Autorun.exe** file for driver installation.
4. Select **Mifare Demo Software V1.5R8**.
5. Follow the on-screen instructions to complete the installation.
6. Once the installation is completed, shut down the system and restart PA-6222 for the changes to take effect.

3-1-9. Wireless Module Driver Utility (Optional)

The wireless driver utility can only be installed on Windows POSReady7 & Windows 8 & Windows 10 series, and it should be installed right after the OS installation.

3-1-9-1. Installation of Wireless Driver

To install the wireless driver, follow the steps below:

1. Connect the USB DVD-ROM device to PA-6222 and insert the driver disk.
2. Enter the "Device\WIFI module" folder where the wireless driver is located.
3. Click **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-6222 for the changes to take effect.

3-1-10. For Intel Trusted Execution Engine Interface

3-1-10-1. Introduction
For POSReady 7 only. Pre-install Microsoft's Kernel-Mode Driver Framework (KMDF) version 1.11 before you install the Intel(R) Trusted Execution Engine (TXE) driver in order to avoid errors in Device Manager.

3-1-10-2. Installation Instructions for Kernel-Mode Driver Framework (KMDF)

To install the Kernel-Mode Driver Framework (KMDF), follow the steps below:

1. Insert the driver disk into a CD ROM device.
2. (For POSReady 7 only) Enter the "Windows 7 KMDF" folder where the Chipset driver is located (depending on your OS platform).
3. (For POSReady 7 only) Click **Setup kmdf-1.11 exe** file for driver installation.
4. Enter the "Intel(R) TXE Package" folder where the Chipset driver is located (depending on your OS platform).
5. Click **Setup TXE.exe** file for driver installation.

3-2. EMBEDDED PERIPHERAL DEVICES

Command lists and driver installation guide for peripheral devices of the system - VFD and MSR – are explicitly included in this section.

3-2-1. VFD: MB-4103 (RS-232)

3-2-1-1. Command List

1.   VFD Registry Operation

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

Registry Name	Default Data	Notes
Default Value	LineDisplay.PMP4000.1	-
BaudRate	9600	-
BitLength	8	-
Parity	0	-
Port	COM1	-
Stop	1	-

1.   OPOS VFD Service Object and Method Relations

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

3-2-1-2. OPOS Driver

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

1. Installation

Below steps guide you to install the **MB4000_OposSetup** program.

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

2. Launching Program

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

‧ Click *LineDisplay* folder from the path *Start/Programs/Protech OPOS*.
‧ Click **Prox-PMP4000** to launch the program.
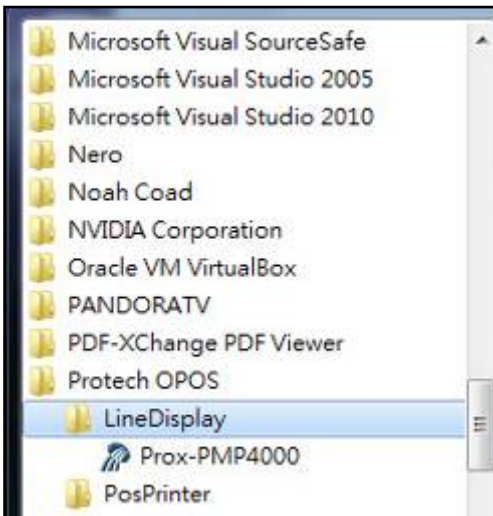
3.   OPOS Control Object of **Prox-PMP4000** program

Main screen buttons:

Button/Item	Description
Text	Display text at the current cursor position.
TextAt	Display the string of characters at the specified "y " and "x ".
Clear	Clear the current window by displaying
Attribute	Normal, blink, reverse, blink, reverse

4.   MB4103 type

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

5. OPOS APIs Support List

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

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	specific long	DeviceRows	Read only	1.0	Not Applicable
Properties	specific long	DeviceColumns	Read only	1.0	Not Applicable
Properties	specific long	DeviceDescriptors	Read only	1.0	Not Applicable
Properties	specific long	DeviceBrightness	R/W	1.0	Not Applicable
Properties	specific long	CharacterSet	R/W	1.0	Not Applicable
Properties	specific string	CharacterSetList	Read only	1.0	Not Applicable
Properties	specific long	CurrentWindow	R/W	1.0	Not Applicable
Properties	specific long	Rows	Read only	1.0	Not Applicable
Properties	specific long	Columns	Read only	1.0	Not Applicable
Properties	specific long	CursorRow	R/W	1.0	Not Applicable
Properties	specific long	CursorColumn	R/W	1.0	Not Applicable
Properties	specific long	CursorType	R/W	1.6	Not Applicable
Properties	specific bool	CursorUpdate	R/W	1.0	Not Applicable
Properties	specific long	MarqueeType	R/W	1.0	Not Applicable
Properties	specific long	MarqueeFormat	R/W	1.0	Not Applicable
Properties	specific long	MarqueeUnitWait	R/W	1.0	Not Applicable
Properties	specific long	MarqueeRepeatWait	R/W	1.0	Not Applicable
Properties	specific long	InterCharacterWait	R/W	1.0	Not Applicable
Properties	specific string	CustomGlyphList	Read only	1.6	Not Applicable
Properties	specific long	GlyphHeight	Read only	1.6	Not Applicable
Properties	specific long	GlyphWidth	Read only	1.6	Not Applicable
Methods	common	Open	-	1.0	Supported
Methods	common	Close	-	1.0	Supported
Methods	common	Claim	-	1.0	Supported
Methods	common	ClaimDevice	-	1.0	Supported
Methods	common	Release	-	1.0	Supported
Methods	common	ReleaseDevice	-	1.0	Supported
Methods	common	CheckHealth	-	1.0	Not Applicable
Methods	common	ClearInput	-	1.0	Not Applicable
Methods	common	ClearOutput	-	1.0	Not Applicable
Methods	common	DirectIO	-	1.0	Not Applicable
Methods	specific	DisplayText	-	1.0	Supported
Methods	specific	DisplayTextAt	-	1.0	Supported
Methods	specific	ClearText	-	1.0	Supported
Methods	specific	ScrollText	-	1.0	Not Applicable
Methods	specific	SetDescriptor	-	1.0	Not Applicable
Methods	specific	ClearDescriptors	-	1.0	Not Applicable
Methods	specific	CreateWindow	-	1.0	Not Applicable
Methods	specific	DestroyWindow	-	1.0	Not Applicable
Methods	specific	RefreshWindow	-	1.0	Not Applicable)
Methods	specific	ReadCharacterAtCursor	-	1.6	Not Applicable
Methods	specific	DefineGlyph	-	1.6	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Events	common	DataEvent	-	1.0	Not Applicable
Events	common	DirectIOEvent	-	1.0	Not Applicable
Events	common	ErrorEvent	-	1.0	Not Applicable
Events	common	OutputComplete Event	-	1.0	Not Applicable
Events	common	StatusUpdate Event	-	1.3	Not Applicable

3-2-2. MSR: MB-3102 (PS/2)

3-2-2-1. OPOS Driver

The **MB301X_OposSetup.exe** program sets up the registry information of MSR reader for OPOS program uses.

1. Installation

Below steps guide you to install the **MB301X_OposSetup** program.

‧ Run the **OPOSMSR_Setup.exe** setup file.
‧ This setup also installs the Prox-PMP3000 program.
‧ Follow the wizard instructions to complete the installation.

2. Launching Program

Below steps guide you load the Prox-PMP3000 program.

‧ Click *MSR* folder from the path *Start/Programs/Protech OPOS*.
‧ Click **Prox-PMP3000** to launch the program.
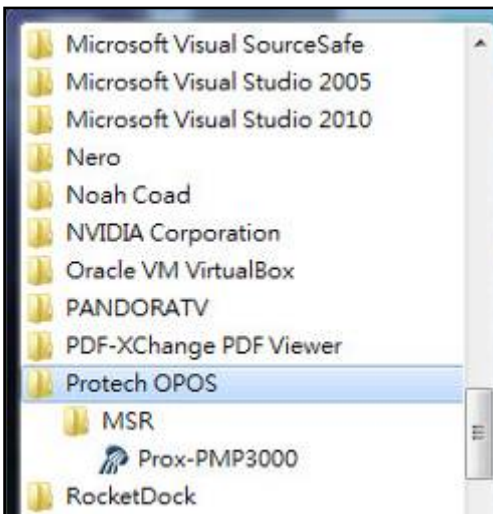
3.   Configuration of **Prox-PMP3000** program

a.) Main screen & Control tab items:
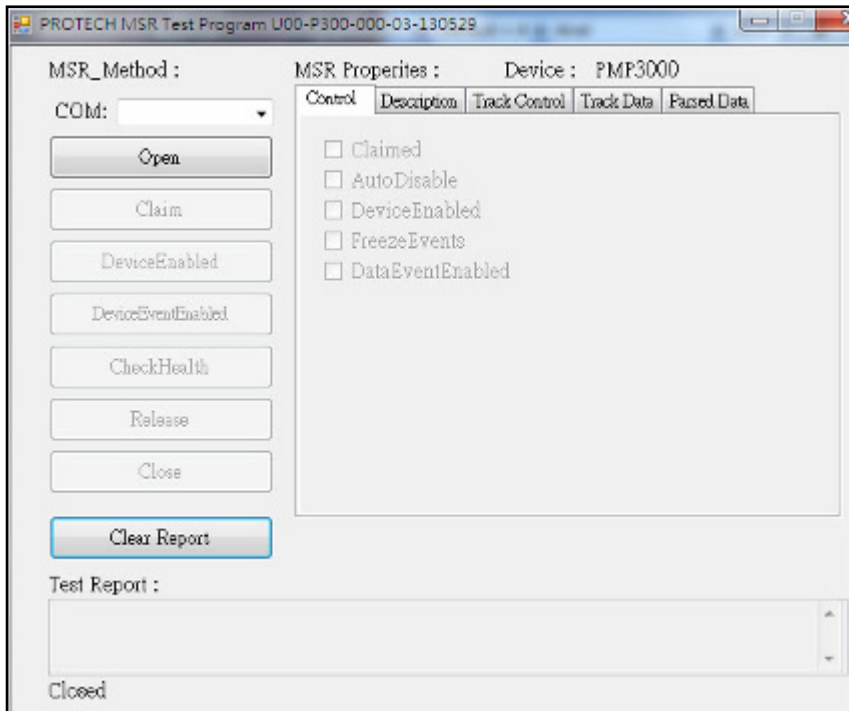
Button/Item	Description
COM	(dropdown list) To set COM port number (only for USRT/USB interface).
AutoDisable	(check box) Set auto-disable
FreeseEvents	(check box) Set freeze events

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

c.)   Track Control tab items

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

d.) Track Data tab items

Button/Item	Description
TracksData	(Row) Display data of all tracks (Track4 is not applicable).

e.) Parsed Data tab items

Button/Item	Description
Parsed Data	Display special properties.

4.   MB301X type (RS232/PS2)

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

5.   OPOS APIs support List

	Category Type	Name	Mutability	OPOS APG Version	VFD .SO
Properties	common bool	AutoDisable	R/W	1.2	Supported
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Supported
Properties	common string	CheckHealthText	Read only	1.0	Supported
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Supported
Properties	common bool	DataEventEnabled	R/W	1.0	Supported
Properties	common bool	DeviceEnabled	R/W	1.0	Supported
Properties	common bool	FreezeEvents	R/W	1.0	Supported
Properties	common long	OpenResult	Read only	1.5	Supported
Properties	common long	OutputID	Read only	1.0	Not Applicable
Properties	common long	PowerNotify	R/W	1.3	Not Applicable
Properties	common long	PowerState	Read only	1.3	Not Applicable
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Supported
Properties	common long	State	Read only	1.0	Not Applicable
Properties	common string	ControlObject Description	Read only	1.0	Not Applicable
Properties	common long	ControlObjectVersion	Read only	1.0	Not Applicable
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObjectVersion	Read only	1.0	Not Applicable
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	DeviceName	Read only	1.0	Supported
Properties	specific bool	CapISO	Read only	1.0	Supported
Properties	specific bool	CapJISOne	Read only	1.0	Supported
Properties	specific bool	CapJISTwo	Read only	1.0	Supported
Properties	specific bool	CapTransmitSentinels	Read only	1.5	Supported
Properties	specific long	TracksToRead	R/W	1.0	Supported
Properties	specific bool	DecodeData	R/W	1.0	Not Applicable
Properties	specific bool	ParseDecodeData	R/W	1.0	Supported
Properties	specific long	ErrorReportType	R/W	1.2	Not Applicable
Properties	specific string	Track1Data	Read only	1.0	Supported
Properties	specific string	Track2Data	Read only	1.0	Supported
Properties	specific string	Track3Data	Read only	1.0	Supported
Properties	specific string	Track4Data	Read only	1.5	Not Applicable
Properties	specific string	AccountNumber	Read only	1.0	Supported
Properties	specific string	ExpirationDate	Read only	1.0	Supported
Properties	specific string	Title	Read only	1.0	Supported

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

3-2-3. MSR: GIGA-TMS MJR243R (RS-232)

3-2-3-1. Command List

1. MSR Registry Operation

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

Registry Name	Default Data	Notes
CapISO	1	Capability for reading ISO track data
CapJISOne	1	(reserved)
CapJISTwo	1	(reserved)
CapTransmitSentinels	1	Capability for reading Transmit Sentinels
Debug	0	Enable the tracing, and create a log file
Description	GIGATMS MSR POS	Description for SO driver
DeviceName	MJR243	Devive Name for CO open
FileName	(NULL)	(reserved)
HardwareProvider	0	(reserved)
Model	MJR243	Device model name
Parity	None	Parity for the communication port
Port	COM4	Comport
Protocol	Hardware	Communication Control
Baudrate	19200	RS232 baudrate

2. OPOS MSR Service Object and Method Relations

Method	Status of support by the driver	Notes
Open	○	-
Close	○	-
Claim	○	-
ClaimDevice	○	-
Release	○	-
ReleaseDevice	○	-
ClearInput	○	-
ClearInputProperties	○	-
DataEvent	○	-
Claimed	○	Read only
DataCount	○	Read only
DataEventEnabled	○	R/W
DeviceEnabled	○	R/W
FreezeEvents	○	R/W
OpenResult	○	Read only
ResultCode	○	Read only
ResultCodeExtended	○	Read only
State	○	Read only
ControlObjectDescription	○	Read only
ControlObjectVersion	○	Read only
ServiceObjectDescription	○	Read only
ServiceObjectVersion	○	Read only
DeviceDescription	○	Read only
DeviceName	○	Read only
CapISO	○	Read only
CapTransmitSentinels	○	Read only
AccountNumber	○	Read only
DecodeData	○	R/W
ExpirationDate	○	Read only
FirstName	○	Read only
MiddleInitial	○	Read Only
ParseDecodeData	○	R/W
ServiceCode	○	Read Only
Suffix	○	Read Only
Surname	○	Read Only
Title	○	Read Only
Track1Data	○	Read Only
Track1DiscretionaryData	○	Read Only

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

3-2-3-2. OPOS MSR Register

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

1.   Installation

Below steps guide you to install the **OPOS MSR Register** program.

‧ Insert the setup CD
‧ Run the setup file **OPOSMSR_Setup.exe** located in the Software folder of CD.
‧ This setup also installs the **OPOS MSR Tester** program.
‧ Follow the wizard instructions to complete the installation.

2.   Launching Program

Below steps guide you to load the **OPOS MSR Register** program.

‧ Click *OPOS* folder from the path *Start/Programs/GIGA-TMS*.
‧ Click **OPOS MSR Register** to launch the program.

3.   Configuration of **OPOS MSR Register** program

a.)   Main screen buttons/items:

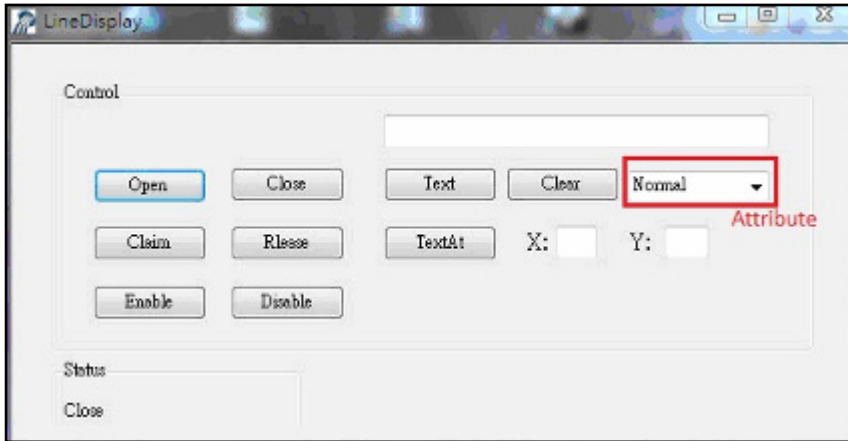| Button/Item	Description
Control Object	(Check box) Register the OPOSMSR.ocx common control object driver. This needs to be checked to run the OPOS MSR Tester program.
Service Object	(Left pane) The Service Object driver types. So far only four types are supported. Each type support specific MSR readers.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

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

c.)   Example 1. MAGTEK USB HID

d.)   Example 2. PROMAG MSR/MJR PART-NO, Keyboard mode.

e.)   Example 3. PROGRAM MSR PART-NO, HID mode.
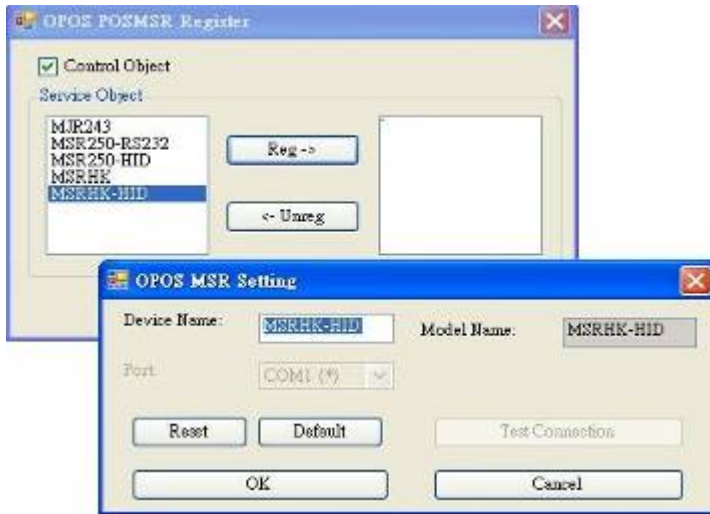
If your system doesn't have any other common control driver, then click Control Object check box.

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

4.   MJR243 type

Key Name	Type	Default Value	Note
CapISO	string	1	Capability for reading ISO track data
CapJISOne	string	1	(reserved)
CapJISTwo	string	1	(reserved)
CapTransmitSentinels	string	1	Capability for reading Transmit Sentinels
Debug	string	0	Enable the tracing, and create a log file
Description	string	GIGATMS MSR POS	Description for SO driver
DeviceName	string	MJR243	Devive Name for CO open
FileName	string	(NULL)	(reserved)
HardwareProvider	string	0	(reserved)
Model	string	MJR243	Device model name
Parity	string	None	Parity for the communication port
Port	string	COM4	Comport Number
Protocol	string	Hardware	Communication Control

Key Name	Type	Default Value	Note
Baudrate	string	19200	RS232 baudrate

5. OPOS APIs support list

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Properties	common bool	AutoDisable	R/W	1.2	Not Applicable
Properties	common long	BinaryConversion	R/W	1.2	Not Applicable
Properties	common bool	CapCompare FirmwareVersion	Read only	1.9	Not Applicable
Properties	common long	CapPowerReporting	Read only	1.3	Not Applicable
Properties	common bool	CapStatisticsReporting	Read only	1.8	Not Applicable
Properties	common bool	CapUpdateFirmware	Read only	1.9	Not Applicable
Properties	common bool	CapUpdateStatistics	Read only	1.8	Not Applicable
Properties	common string	CheckHealthText	Read only	1.0	Not Applicable
Properties	common bool	Claimed	Read only	1.0	Supported
Properties	common long	DataCount	Read only	1.2	Supported
Properties	common bool	DataEventEnabled	R/W	1.0	Supported
Properties	common bool	DeviceEnabled	R/W	1.0	Supported
Properties	common bool	FreezeEvents	R/W	1.0	Supported
Properties	common long	OpenResult	Read only	1.5	Supported
Properties	common long	OutputID	Read only	1.0	Not Applicable
Properties	common long	PowerNotify	R/W	1.3	Not Applicable
Properties	common long	PowerState	Read only	1.3	Not Applicable
Properties	common long	ResultCode	Read only	1.0	Supported
Properties	common long	ResultCodeExtended	Read only	1.0	Supported
Properties	common long	State	Read only	1.0	Supported
Properties	common string	ControlObject Description	Read only	1.0	Supported
Properties	common long	ControlObjectVersion	Read only	1.0	Supported
Properties	common string	ServiceObject Description	Read only	1.0	Supported
Properties	common long	ServiceObjectVersion	Read only	1.0	Supported
Properties	common string	DeviceDescription	Read only	1.0	Supported
Properties	common string	DeviceName	Read only	1.0	Supported
Properties	specific bool	CapISO	Read only	1.0	Supported
Properties	specific bool	CapJISOne	Read only	1.0	Not Applicable
Properties	specific bool	CapJISTwo	Read only	1.0	Not Applicable
Properties	specific bool	CapTransmit Sentinels	Read only	1.5	Supported
Properties	specific long	CapWriteTracks	Read only	1.1	Not Applicable

	Category Type	Name	Mutability	OPOS APG Version	MSR .SO
Properties	specific string	AccountNumber	Read only	1.0	Supported
Properties	specific bool	DecodeData	R/W	1.0	Supported
Properties	specific long	EncodingMaxLength	Read only	1.1	Not Applicable
Properties	specific long	ErrorReportType	R/W	1.2	Not Applicable
Properties	specific string	ExpirationDate	Read only	1.0	Supported
Properties	specific string	FirstName	Read only	1.0	Supported
Properties	specific string	MiddleInitial	Read only	1.0	Supported
Properties	specific bool	ParseDecodeData	R/W	1.0	Supported
Properties	specific string	ServiceCode	Read only	1.0	Supported
Properties	specific string	Suffix	Read only	1.0	Supported
Properties	specific string	Surname	Read only	1.0	Supported
Properties	specific string	Title	Read only	1.0	Supported
Properties	specific binary	Track1Data	Read only	1.0	Supported
Properties	specific binary	Track1 DiscretionaryData	Read only	1.0	Supported
Properties	specific binary	Track2Data	Read only	1.0	Supported
Properties	specific binary	Track2 DiscretionaryData	-	1.0	Supported
Properties	specific binary	Track3Data	Read only	1.0	Supported
Properties	specific binary	Track4Data	Read only	1.5	Not Applicable
Properties	specific long	TracksToRead	R/W	1	Supported
Properties	specific long	TracksToWrite	R/W	1.1	Not Applicable
Properties	specific bool	TransmitSentinels	R/W	1.5	Supported
Methods	common	Open	-	1	Supported
Methods	common	Close	-	1	Supported
Methods	common	Claim	-	1	Supported
Methods	common	ClaimDevice	-	1.5	Supported
Methods	common	Release	-	1	Supported
Methods	common	ReleaseDevice	-	1.5	Supported
Methods	common	CheckHealth	-	1	Not Applicable
Methods	common	ClearInput	-	1	Supported
Methods	common	ClearInput Properties	-	1.1	Supported
Methods	common	ClearOutput	-	1	Not Applicable
Methods	common	DirectIO	-	1	Not Applicable
Methods	common	Compare FirmwareVersion	-	1.9	Not Applicable
Methods	common	ResetStatistics	-	1.8	Not Applicable
Methods	common	RetrieveStatistics	-	1.8	Not Applicable

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

3-2-3-3. OPOS MSR Tester

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

1.   Installation

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

2.   Launching Program

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

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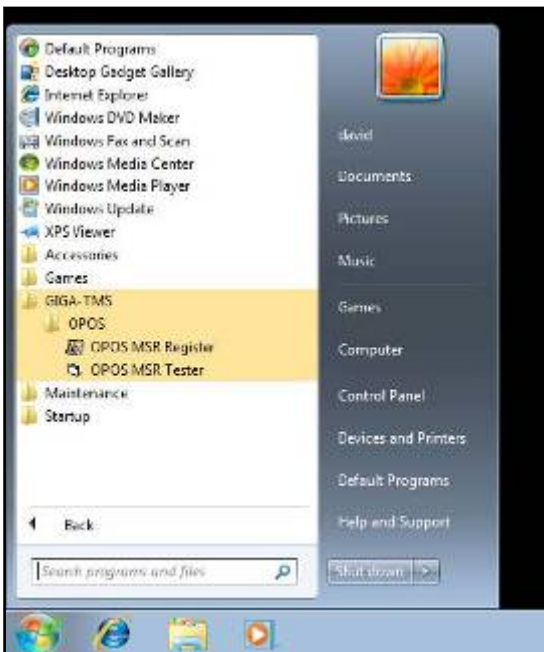
3. Configuration for OPOS MSR Tester Program

a.) Main screen buttons/items:

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

b.) To start using OPOS driver to get track data, follow the steps below.
   Step 1: Entering the **Device Name**.
   Step 2: Clicking **Open** button.
   Step 3: Swiping card to get track data.

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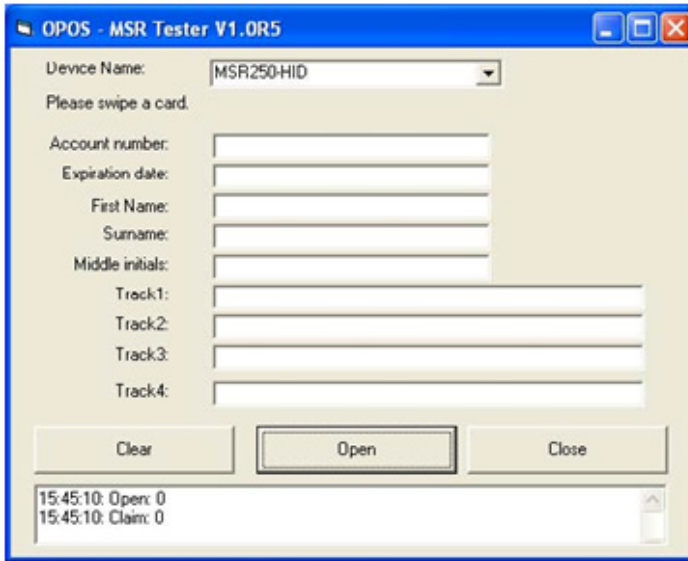
d.)   Example 2. PROMAG MSR/MJR PART-NO, Keyboard mode
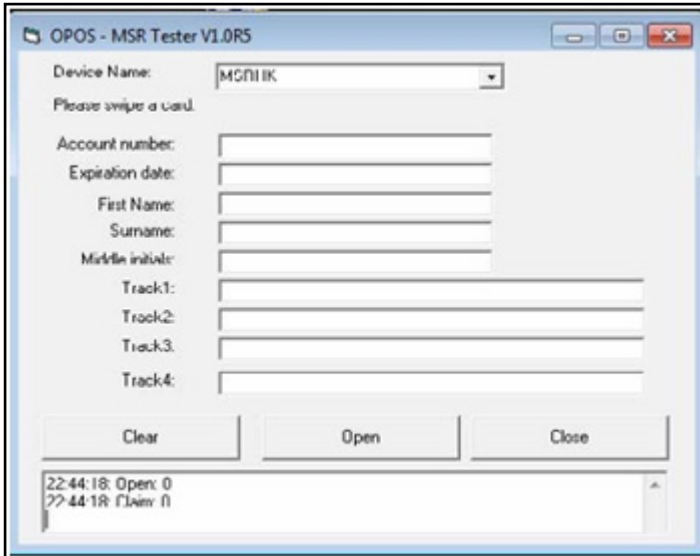
e.) Example 3. PROMAG MSR PART-NO, HID mode
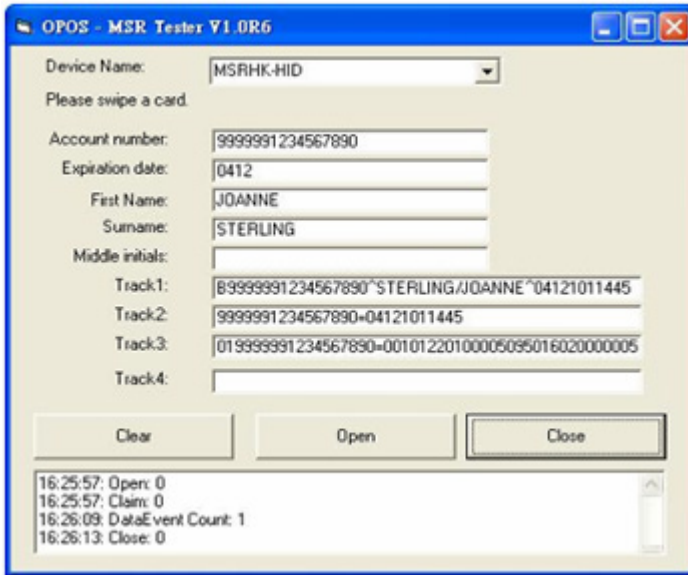
3-3. API

3-3-1. API Package Content

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

Function DLL			
Directory	**Function**	**File Name**	**Description**
ProxAPI standard	**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

3-3-2. API Procedure

Take **VB2005 .NET** for example.

1. First you must 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

2. Then 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
```

3-3-3. Sample Code

1.   VB Declaration Method

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

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

‧ 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)

2. 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);}

▪ 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

3. VB.NET extern function:

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

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

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

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

4. VB 6 extern function:

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

Note: VB.net short = integer VB6

3-3-4. Cash Drawer

Button/Item	Description
OPEN (button)	Tap to open the cash drawer.
Cash Drawer Status	Cash drawer status will be displayed after **OPEN** is tapped.

‧ Drawer is closed as shown:

‧ Drawer is open as shown:

3-3-5. 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

3-3-6. Cash Drawer Function

CashDrawerOpen
---

bool   CashDrawerOpen (short   num_drawer);

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

Example: CashDrawerOpen(0x01);   // Open the Cash Drawer1

GetCashDrawerStatus
---

bool   GetCashDrawerStatus (short   num_drawer);

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

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

3-4. BIOS Operation

3-4-1. Introduction

The system 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 provide standard environment for booting an operating system and running pre-boot applications. Following illustration shows Extensible Firmware Interface's position in the software stack.
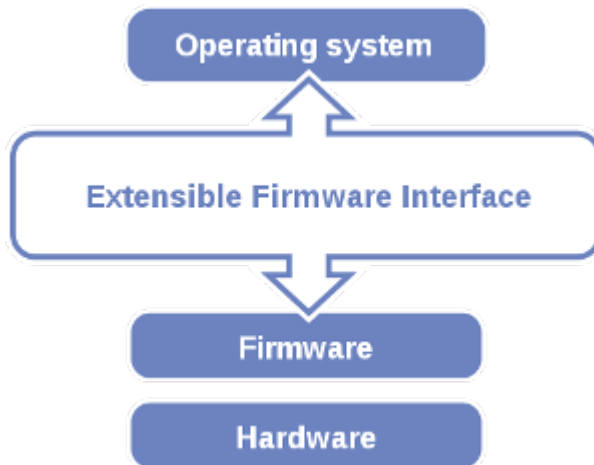
EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

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

3-4-2. Entering Setup

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:


```
Version 2.18.1249. Copyright (C) 2018 American Megatrends, Inc.
BIOS Date: 11/20/2018 10:31:35 Ver: 62253PD5
Press <DEL> or <ESC> to enter setup.
```

POST Screen

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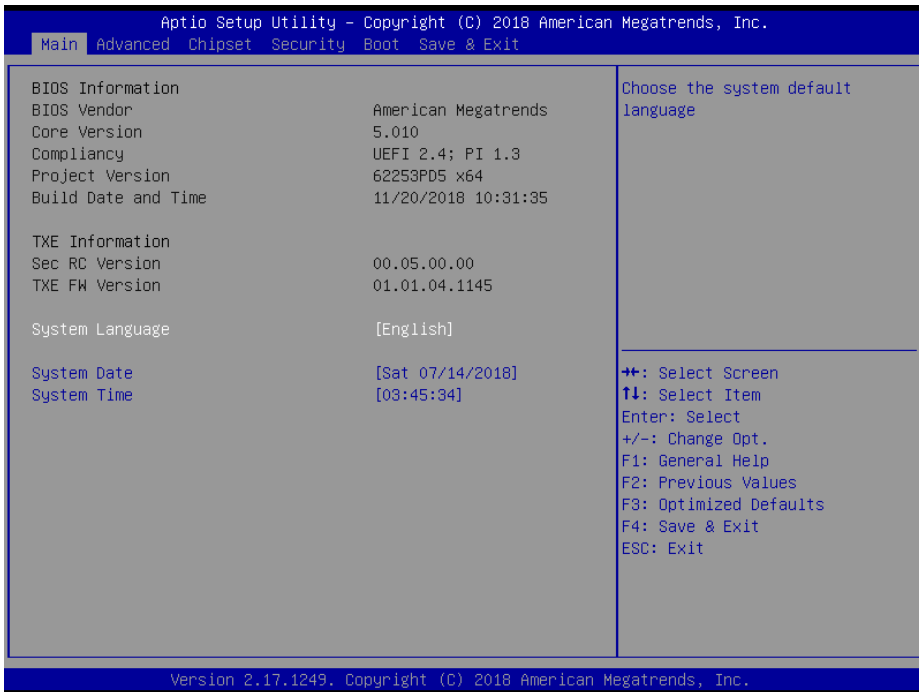
BIOS Setup Program Initialization Screen

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

3-4-3. Main
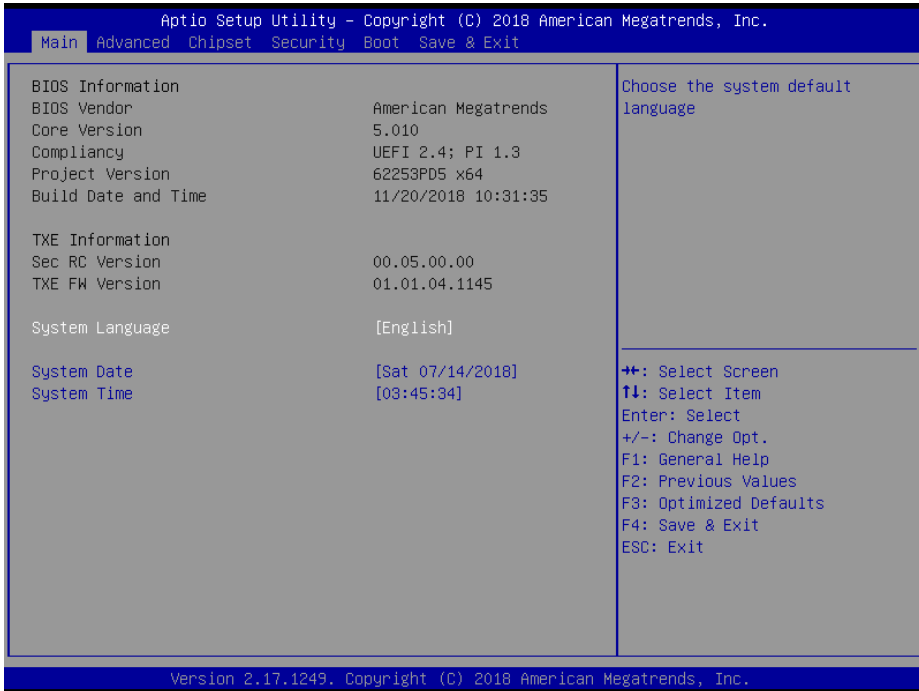
Main Screen

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of current BIOS version.
TXE Firmware Version	No changeable options	Displays the current TXE Version
Sec RC Version	No changeable options	Displays the current Sec RC version.
System Language	English	BIOS Setup language.
System Date	Month, day, year	Sets the system date. The format is [Day Month/ Date/ Year]. Users can directly enter values or use <+> or <->

BIOS Setting	Options	Description/Purpose
		arrow keys to increase/decrease it. The "Day" is automatically changed.
System Time	Hour, minute, second	Sets the system time. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.

3-4-4. Advanced

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
      Main   Advanced  Chipset  Security  Boot  Save & Exit

▶ ACPI Settings                                      System ACPI Parameters.
▶ Hardware Monitor
▶ F81866 Watchdog
▶ CPU Configuration
▶ IDE Configuration
▶ OS Selection
▶ Voltage/RI Adjust Configureation
▶ CSM Configuration
▶ USB Configuration

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


              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Advanced Screen

BIOS Setting	Options	Description/Purpose
ACPI Settings	Sub-Menu	System ACPI Parameters.
Hardware Monitor	Sub-Menu	Monitors hardware status.
F81866 Watchdog	Sub-Menu	F81866 Watchdog Parameters.
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
IDE Configuration	Sub-Menu	SATA Configuration Parameters.
OS Selection	Sub-Menu	OS Selection.
Voltage/RI Adjust Configuration	Sub-Menu	Voltage Adjustment settings.
CSM Configuration	Sub-Menu	Configures Option ROM execution, boot options filters, etc.
USB Configuration	Sub-Menu	USB Configuration Parameters.
SIO Configuration	Sub-Menu	SIO Configuration Parameters.

3-4-4-1. ACPI Settings

```
            Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
     Advanced

 ACPI Settings                                        Enables or Disables BIOS ACPI
                                                      Auto Configuration.
 Enable ACPI Auto Configuration      [Disabled]

 Enable Hibernation                  [Enabled]
 Lock Legacy Resources               [Disabled]




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



            Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```
ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable ACPI Auto Configuration	- Disabled - Enabled	Enables or Disables ACPI feature.
Enable Hibernation	- Disabled - Enabled	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
Lock Legacy Resources	- Disabled - Enabled	Enables or Disables Lock of Legacy Resources.

3-4-4-2. Hardware Monitor

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
        Advanced

 Pc Health Status

 CPU Temperature                     : +45 ℃
 System temperature                  : +35 ℃
 VCORE                               : +0.848 V
 VCC5                                : +5.087 V
 VCC12                               : +11.968 V
 VCC3V                               : +3.312 V
 VSB3V                               : +3.344 V
 VBAT                                : +3.248 V

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

              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Hardware Monitor Screen

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

3-4-4-3. F81866 Watchdog

```
                 Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
        Advanced

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

     Watchdog timer unit                  [1s]
     Count for Timer (Seconds)            10




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



                 Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

F81866 Watchdog screen

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

3-4-4-4. CPU Configuration

```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
      Advanced

    CPU Configuration                                      Socket specific CPU Information

  ▶ Socket 0 CPU Information

    CPU Speed                          2001 MHz
    64-bit                             Supported

    Limit CPUID Maximum                [Disabled]
    Intel Virtualization Technology    [Enabled]

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

                Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

CPU Configuration Screen

BIOS Setting	Options	Description/Purpose
Socket 0 CPU Information	Sub-Menu	Reports CPU Information.
CPU Speed	No changeable options	Reports the current CPU Speed
64-bit	No changeable options	Reports if the processor supports Intel x86-64 (amd64) implementation.
Limit CPUID Maximum	- Disabled - Enabled	Enables for legacy operating systems to boot processors with extended CPUID functions. When this option is enabled, the processor will limit the maximum CPUID input value to 03h when queried. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried. Set "Disabled" for WinXP.
Intel Virtualization Technology	- Disabled - Enabled	When enabled, a VMM (Virtual Machine Monitor) can utilize the additional hardware capabilities provided by Vanderpool Technology (VT).

```
            Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
     Advanced

     Socket 0 CPU Information

     Intel(R) Celeron(R) CPU J1900 @ 1.99GHz
     CPU Signature                   30678
     Microcode Patch                 835
     Max CPU Speed                   1990 MHz
     Min CPU Speed                   1334 MHz
     Processor Cores                 4
     Intel HT Technology             Not Supported
     Intel VT-x Technology           Supported

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




            Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Socket 0 CPU Information Screen

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

3-4-4-5. IDE Configuration

```
        Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
            Advanced

   IDE Configuration                                    Enable / Disable Serial ATA

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

   SATA Speed Support               [Gen2]
   SATA Mode                        [AHCI Mode]

   SATA Port 0(Note*1)              [Enabled]
   SATA Port0 HotPlug               [Disabled]


   SATA Port0
   Not Present                                          ──────────────────────────
                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



        Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

IDE Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial-ATA (SATA)	- Disabled - Enabled	Enables or disables SATA Device.
SATA Test Mode	- Disabled - Enabled	Enables or disables SATA Test Mode.
SATA Speed Support	- GEN1 - GEN2	• **Gen1** mode sets the device to 1.5 Gbit/s speed. • **Gen2** mode sets the device to 3 Gbit/s speed (in case it is compatible).
SATA Mode	- IDE mode - AHCI mode	Configures SATA as following: • **IDE:** Set SATA operation mode to IDE mode. • **AHCI:** SATA works as AHCI (Advanced Host Controller Interface) mode for achieving better performance.
SATA Port 0 (Note*1)	- Disabled - Enabled	Enables or disables SATA port 0 Device.

BIOS Setting	Options	Description/Purpose
SATA Port 0 HotPlug	- Disabled - Enabled	Enables or disables SATA port 0 Device HotPlug.
SATA Port 0	- [drive]	Displays the drive installed on this SATA port 0. Shows [Empty] if no drive is installed. If the mother board supports RAID, it will show ASMT109x- Conf (0.1GB)

Note*1: If the board support RAID function, the switch controls RAID SATA Port (SATA1 and SATA2) on board.

3-4-4-6. OS Selection

```
          Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
     Advanced

  OS Selection                                          OS Selection
  OS Selection                        [Windows 7]


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



          Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```
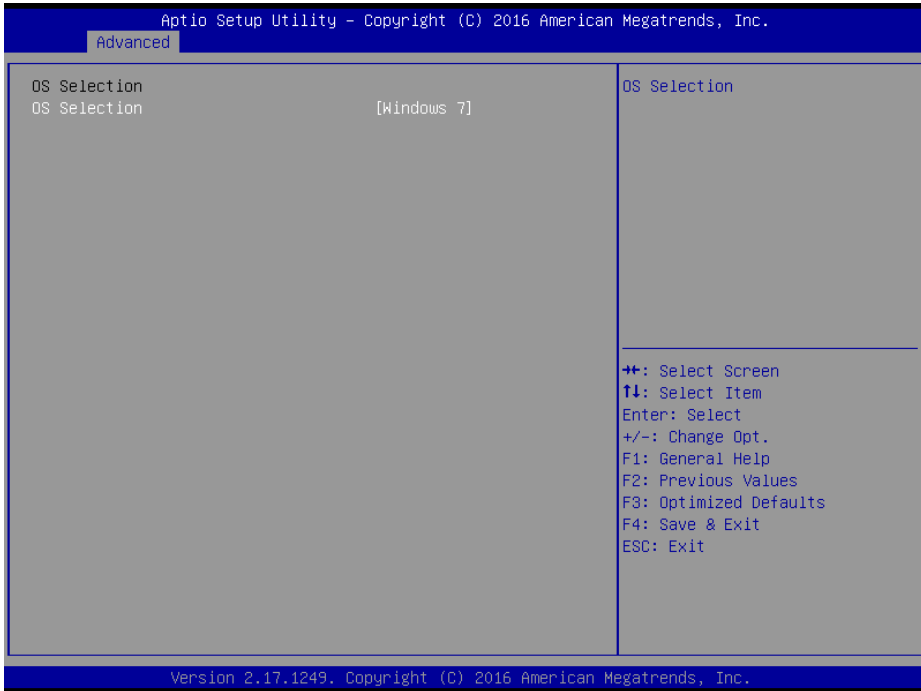
OS Selection Screen

BIOS Setting	Options	Description/Purpose
OS Selection	- Windows 8.x & 10 - Windows 7	Operating System Selection.

3-4-4-7. Voltage Adjustment Configuration

```
            Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
      Advanced

   COM1 select                          [Disabled]              COM1 select RI 12V and 5V
   COM2 select                          [Disabled]
   COM3 select                          [Disabled]
   COM4 select                          [Disabled]
   Cash drawer                          [Cash drawer 12V]




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




            Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Voltage Adjustment Configuration Screen

BIOS Setting	Options	Description/Purpose
COM1 Voltage Select	- Disabled - RI -12V -5V	Selects COM1 Port voltage.
COM2 Voltage Select	- Disabled - RI -12V -5V	Selects COM2 Port voltage.
COM3 Voltage Select	- Disabled - RI -12V -5V	Selects COM3 Port voltage.
COM4 Voltage Select	- Disabled - RI -12V -5V	Selects COM4 Port voltage.
Cash drawer	- Cash drawer 12V - Cash drawer 24V	Selects Cash drawer voltage.

3-4-4-8. CSM Configuration

This menu provides advanced CSM (Compatibility Support Module) configurations such as Enable/Disable CSM Support, configure Option ROM execution, boot options filters, etc.

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
        Advanced

     Compatibility Support Module Configuration              Enable/Disable CSM Support.

     CSM Support                        [Enabled]

     CSM16 Module Version               07.76

     GateA20 Active                     [Upon Request]
     Option ROM Messages                [Force BIOS]

     Boot option filter                 [Legacy only]

     Option ROM execution

     Network                            [Do not launch]     ⇵: Select Screen
     Storage                            [Legacy]            ⇅: Select Item
     Video                              [Legacy]            Enter: Select
     Other PCI devices                  [Legacy]            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit

              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

CSM Configuration Screen

BIOS Setting	Options	Description/Purpose
CSM Support	- Disabled - Enabled	Disables or Enables CSM support
CSM16 Module Version	No changeable options	Displays the current CSM version.
GateA20 Active	- Upon Request - Always	Selects Gate A20 operation mode. ・ **Upon Request:** GA20 can be disabled using BIOS services. ・ **Always:** Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	- Force BIOS - Keep Current	Sets the display mode for Option ROM messages.

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

3-4-4-9. USB Configuration

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
         Advanced

     USB Configuration                               Enables Legacy USB support.
                                                     AUTO option disables legacy
     USB Module Version              10              support if no USB devices are
                                                     connected. DISABLE option will
     USB Devices:                                    keep USB devices available
          1 Drive, 1 Keyboard, 2 Mice, 1 Point, 2 Hubs   only for EFI applications.

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

     USB hardware delays and time-outs:             ────────────────────────────
     USB transfer time-out           [20 sec]       ↔: Select Screen
     Device reset time-out           [20 sec]       ↑↓: Select Item
     Device power-up delay           [Auto]         Enter: Select
                                                    +/-: Change Opt.
     Mass Storage Devices:                          F1: General Help
     JetFlashTranscend 128MB 8.07    [Auto]         F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

         Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

USB Configuration Screen

BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays the number of available USB devices.
Legacy USB Support	- Disabled - Enabled - Auto	Sets to "Enabled" if you want to use USB device in the legacy operating system.
XHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without XHCI (Extensible Host Controller Interface) hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without EHCI (Enhanced Host Controller Interface) hand-off support.
USB Mass Storage Driver Support	- Disabled - Enabled	Enables/Disables USB mass storage driver support.

BIOS Setting	Options	Description/Purpose
USB transfer time-out	1 / 5 / 10 /20 sec	Configures the time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 / 20 / 30 / 40 sec	Configures the time-out value of the Start Unit command for the USB mass storage device.
Device power-up delay	- Auto - Manual	The maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses the default value: for a Root port, it is 100 ms; for a Hub port, the delay is taken from Hub descriptor. If "Manual" is specified, the "Device power-up delay in second" option will display for users to configure the delay time range.
Device power-up delay in seconds	Multiple options ranging from 1 to 40	The delay time range is from 1 to 40 seconds in one second increment.
Mass Storage Devices:	- Auto - Floppy - Force FDD - Hard Disk - CD-ROM	Displays the device name and chooses the mass storage emulation type.

3-4-4-10.Super IO Configuration

```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
         Advanced

 SIO Configuration                                        Set Parameters of Serial Port
                                                          1 (COMA)
    Super IO Chip                        F81866
 ▶ Serial Port 1 Configuration
 ▶ Serial Port 2 Configuration
 ▶ Serial Port 3 Configuration
 ▶ Serial Port 4 Configuration
 ▶ Parallel Port Configuration


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



                Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Super IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-Menu	Sets Parameters for COM1.
Serial Port 2 Configuration	Sub-Menu	Sets Parameters for COM2.
Serial Port 3 Configuration	Sub-Menu	Sets Parameters for COM3.
Serial Port 4 Configuration	Sub-Menu	Sets Parameters for COM4.
Parallel Port Configuration	Sub-Menu	Sets Parameters for LPT port.

```
              Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
      Advanced

   Serial Port 1 Configuration                                    Enable or Disable Serial Port
                                                                  (COM)
   Serial Port                         [Enabled]
   Device Settings                     IO=3F8h; IRQ=4;

   Change Settings                     [Auto]





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



              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Enables or disables serial port 1.
Device Settings	No changeable options	Displays the current settings of serial port 1.
Change Settings	- Auto - IO=3F8h; IRQ=4; - IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Selects IRQ and I/O resource settings for serial port 1.

```
              Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
        Advanced

     Serial Port 2 Configuration                                Enable or Disable Serial Port
                                                                (COM)
     Serial Port                        [Enabled]
     Device Settings                    IO=2F8h; IRQ=3;

     Change Settings                    [Auto]




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




              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Serial Port 2 Configuration Screen

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

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
    Advanced

 Serial Port 3 Configuration                                   Enable or Disable Serial Port
                                                               (COM)
 Serial Port                          [Enabled]
 Device Settings                      IO=3E8h; IRQ=7;

 Change Settings                      [Auto]




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


              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Serial Port 3 Configuration Screen

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

```
                 Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
        Advanced

    Serial Port 4 Configuration                                    Enable or Disable Serial Port
                                                                   (COM)
    Serial Port                         [Enabled]
    Device Settings                     IO=2E8h; IRQ=10;

    Change Settings                     [Auto]




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



                 Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Serial Port 4 Configuration Screen

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

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
        Advanced

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

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




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




              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Parallel Port Configuration Screen

BIOS Setting	Options	Description/Purpose
Parallel Port	- Disabled - Enabled	Enables or disables the printer port.
Device Settings	No changeable options	Displays the current settings of the printer port.
Change Settings	- Use Automatic Settings - IO=378h; IRQ=5 - IO=378h; IRQ=5,6,7,9,10,11,12 - IO=278h; IRQ=5,6,7,9,10,11,12 - IO=3BCh; IRQ=5,6,7,9,10,11,12	Selects IRQ and I/O resource settings for the printer port.
Device Mode	- STD Printer Mode - SPP Mode - EPP-1.9 and SPP Mode - EPP-1.7 and SPP Mode - ECP Mode - ECP and EPP 1.9 Mode - ECP and EPP 1.7 Mode	Selects the mode for the parallel port. Not available if the parallel port is disabled. **SPP** is Standard Parallel Port mode, a bi-directional mode for printers. **EPP** is Enhanced Parallel Port mode, a high-speed

BIOS Setting	Options	Description/Purpose
		bi-directional mode for non-printer peripherals. **ECP** is Enhanced Capability Port mode, a high-speed bi-directional mode for printers and scanners.

3-4-5. Chipset

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

  ▶ North Bridge                                        North Bridge Parameters
  ▶ South Bridge




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



              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```
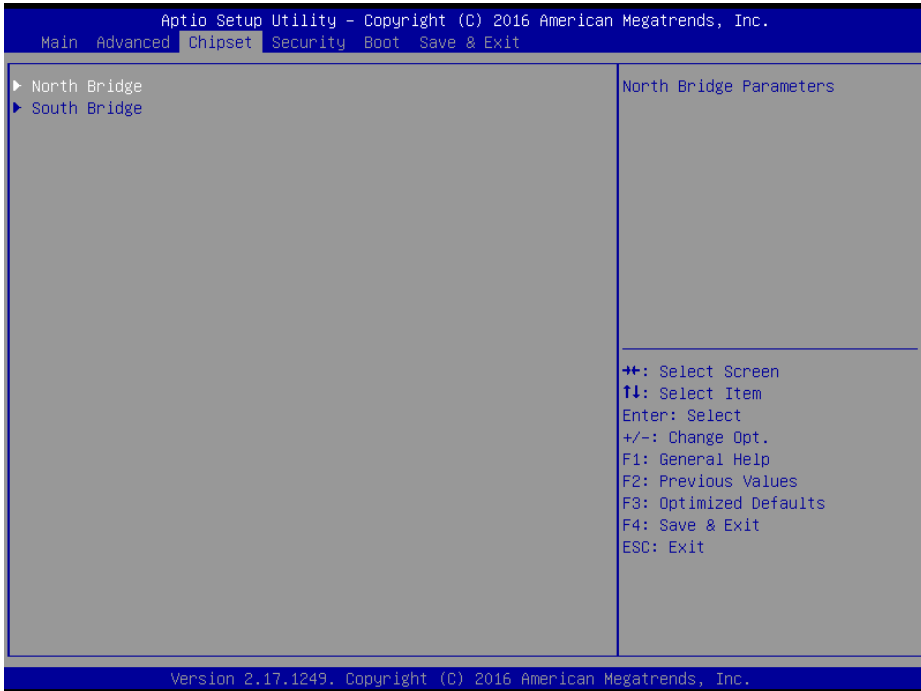
Chipset Screen

BIOS Setting	Options	Description/Purpose
North Bridge	Sub-Menu	Sets parameter for North Bridge configuration.
South Bridge	Sub-Menu	Sets parameters for South Bridge configuration.

3-4-5-1. North Bridge

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
             Chipset
▶ Intel IGD Configuration                              Config Intel IGD Settings.
  LVDS Backlight Control              255

  Memory Information

  Total Memory                        4096 MB (DDR3L)



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



          Version 2.17.1249. Copyright (C) 2018 American Megatrends, Inc.
```

North Bridge Screen

BIOS Setting	Options	Description/Purpose
Intel IGD Configuration	Sub-Menu	Configures Graphics settings.
LVDS Backlight Control	Multiple options ranging from 16 to 255 *Default: 255(Maximum)	Set LVDS backlight brightness from 16 to 255.
Memory Information	No changeable options	Displays the DRAM information on the platform.
Total Memory	No changeable options	Displays the DRAM size.

```
              Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
               Chipset

   GOP Configuration                                            Enable GOP Driver will unload
   GOP Driver                        [Enabled]                  VBIOS; Disbale it will load
                                                                VBIOS
   Intel IGD Configuration

   Integrated Graphics Device        [Enabled]

   IGD Turbo Enable                  [Enabled]
   DVMT Pre-Allocated                [64M]

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

              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Intel IGD Configuration Screen

BIOS Setting	Options	Description/Purpose
GOP Driver	- Disabled - Enabled	Enables or disables GOP Driver for UEFI OS.
Intel IGD Configuration	No changeable options	Displays the IGD information on the platform.
Integrated Graphics Device	- Disabled - Enabled	• **Enabled:** Enables Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. • **Disabled:** Always disables IGD.
IGD Turbo Enable	- Disabled - Enabled	Enables or disables IGD Turbo.
DVMT Pre-Allocated	- 32M - 64M - 96M - 128M - 256M - 512M	Selects DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

3-4-5-2. South Bridge

```
              Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
                Chipset

  ▶ USB Configuration                                      USB Configuration Settings
  ▶ PCI Express Configuration

    High Precision Timer             [Enabled]
    Restore AC Power Loss            [Last State]



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




              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```
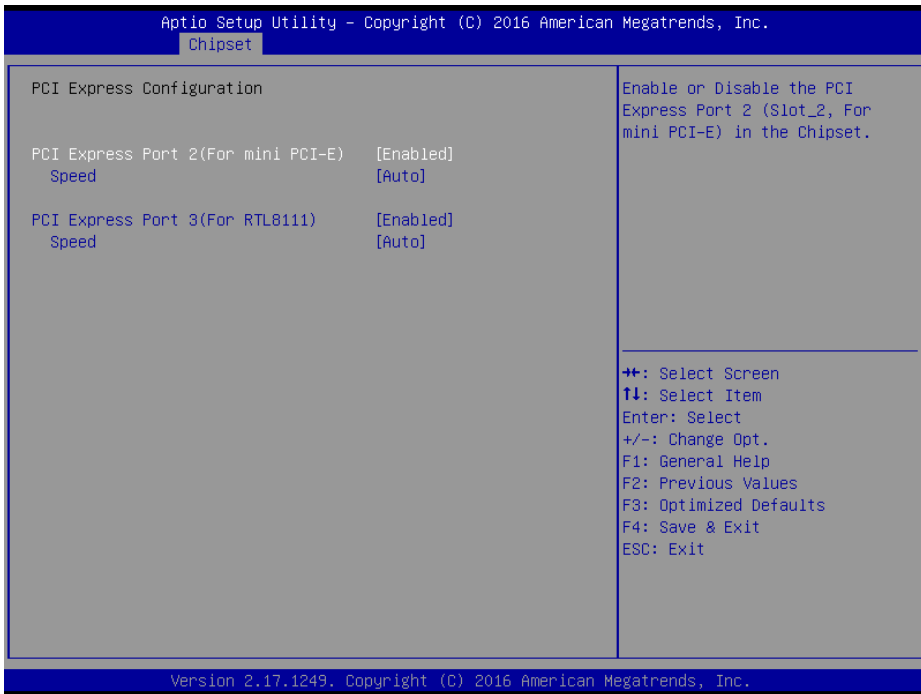
South Bridge Screen

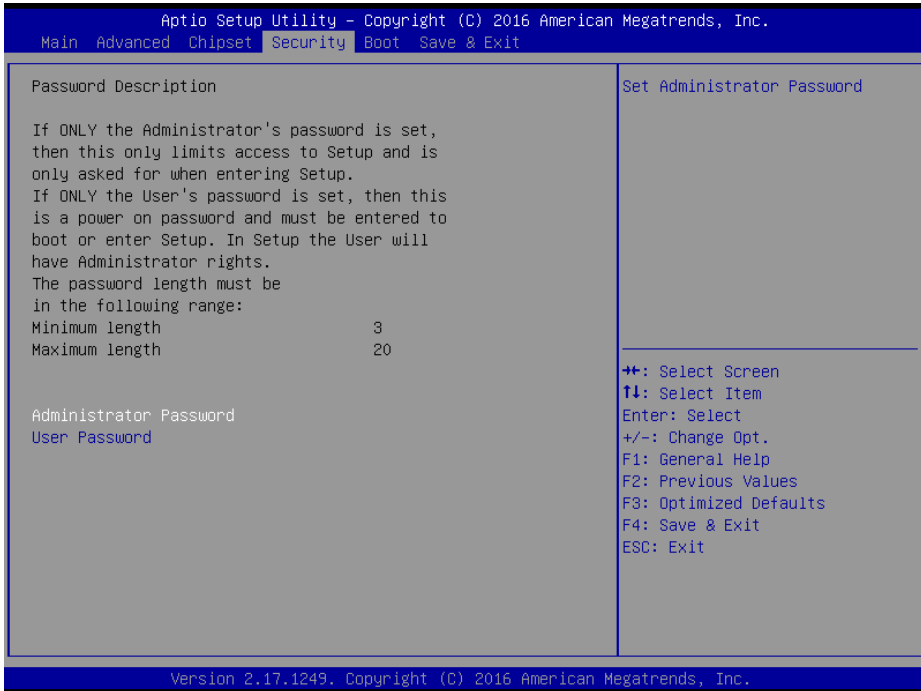| BIOS Setting	Options	Description/Purpose
USB Configuration	Sub-Menu	Configures USB parameters.
PCI Express Configuration	Sub-Menu	Configures PCH PCIE parameters.
High Precision Timer	- Disabled - Enabled	Enables or disables the HPET (High Precision Event Timer)
Restore AC Power Loss	- Power Off - Power On - Last State	Selects AC power state when the power is re-applied following a power failure. • **Power Off** keeps the system powered off till the Power button is pressed. • **Power On** keeps the system powered on after the system restores AC power to the board. • **Last State** brings the system back to the last power state when the AC power is removed.

```
          Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
               Chipset

     USB Configuration                                      Control the USB EHCI (USB 2.0)
                                                            functions.  One EHCI
     XHCI Mode                       [Disabled]             controller must always be
                                                            enabled
     USB 2.0(EHCI) Support           [Enabled]
     USB EHCI debug                  [Disabled]
     USB Per Port Control            [Enabled]
     USB Port 0                      [Enabled]
     USB Port 1                      [Enabled]
     USB Port 2                      [Enabled]
     USB Port 3                      [Enabled]

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

          Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

USB Configuration Screen

BIOS Setting	Options	Description/Purpose
USB 2.0 (EHCI) Support	- Disabled - Enabled	(XHCI Mode must be disabled.) Enables Enhanced Host Controller Interface 1 for high-speed USB functions (USB 2.0).
USB Per Port Control	- Disabled - Enabled	Enables or Disables each USB port.
USB Port 0	- Disabled - Enabled	Enables or Disables USB port 0.
USB Port 1	- Disabled - Enabled	Enables or Disables USB port 1.
USB Port 2	- Disabled - Enabled	Enables or Disables USB port 2.
USB Port 3	- Disabled - Enabled	Enables or Disables USB port 3.

```
           Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
              Chipset

      PCI Express Configuration                         Enable or Disable the PCI
                                                        Express Port 2 (Slot_2, For
                                                        mini PCI-E) in the Chipset.
      PCI Express Port 2(For mini PCI-E)    [Enabled]
        Speed                               [Auto]

      PCI Express Port 3(For RTL8111)       [Enabled]
        Speed                               [Auto]




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



              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

PCI Express Configuration Screen

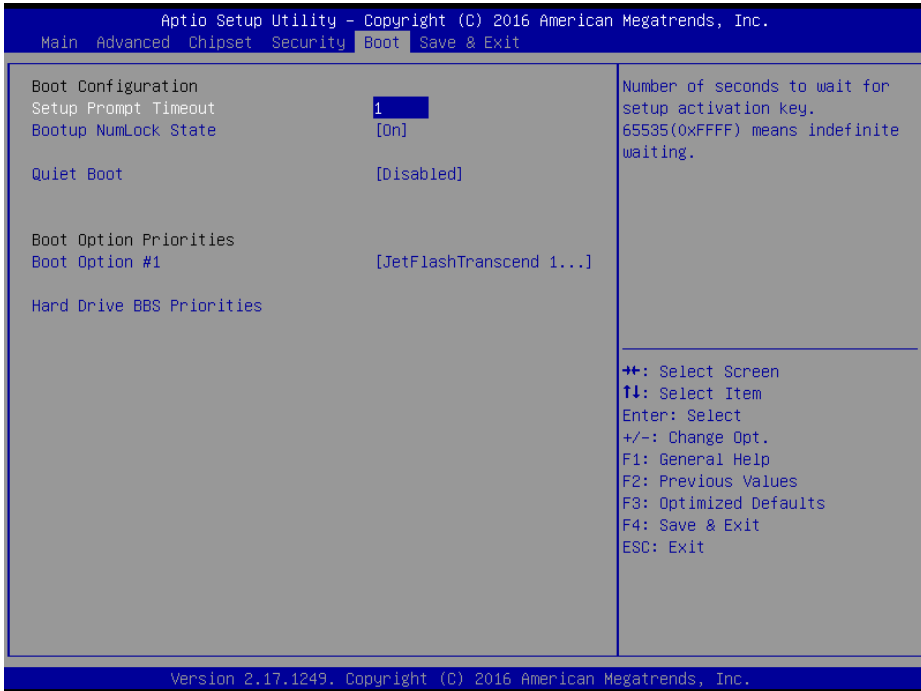| BIOS Setting	Options	Description/Purpose
PCI Express Port 2(For mini PCI-E)	- Disabled - Enabled	Enables or Disables PCI Express port 2.
Speed	- Auto - Gen1 - Gen2	Selects the speed of PCI Express port 2.
PCI Express Port 3(For RTL8111)	- Disabled - Enabled	Enables or Disables PCI Express port 3.
Speed	- Auto - Gen1 - Gen2	Selects the speed of PCI Express port 3.

3-4-6. Security

Security Screen

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

3-4-7. Boot

This menu provides control items for system boot configuration.

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

      Boot Configuration                               Number of seconds to wait for
      Setup Prompt Timeout            1                setup activation key.
      Bootup NumLock State            [On]             65535(0xFFFF) means indefinite
                                                       waiting.
      Quiet Boot                      [Disabled]


      Boot Option Priorities
      Boot Option #1                  [JetFlashTranscend 1...]

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



         Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```

Boot Configuration Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Selects the NumLock sate after the system is powered on. • **On:** Enables the NumLock function automatically after the system is powered on. • **Off:** Disables the NumLock function after the system is powered on.
Quiet Boot	- Disabled - Enabled	Enables/Disables Quiet Boot option. When this option is set to "Disabled", BIOS will display normal POST messages.
Boot Option #1~#n	- [Drive(s)] - Disabled	Allow users to choose the boot sequence from the available device(s).

BIOS Setting	Options	Description/Purpose
		Note that in the menu displayed, you will only see the device with the highest priority for a specific boot device type.
Hard Drive BBS Priorities	Sub-Menu	Defines the boot order for all the hard drives connected to the system, e.g. SATA, USB drive.

3-4-7-1. Hard Drive BBS Priorities

```
              Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
                                     Boot

   Boot Option #1                       [JetFlashTranscend 1...]   Sets the system boot order




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




              Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.
```
Hard Drive BBS Priorities Screen

BIOS Setting	Options	Description/Purpose
Boot Option #1 - #n	- [Drive(s)] - Disabled	Allow users to set the priority of all the drives connected to the system or another bootable USB storage. Press **Enter** to enter the sub-menu and press < ↑ > or < ↓ > arrow keys to select the device. Another way is to press <+> or <-> to move the selected device up/down in the priority list.

3-4-8. Save & Exit
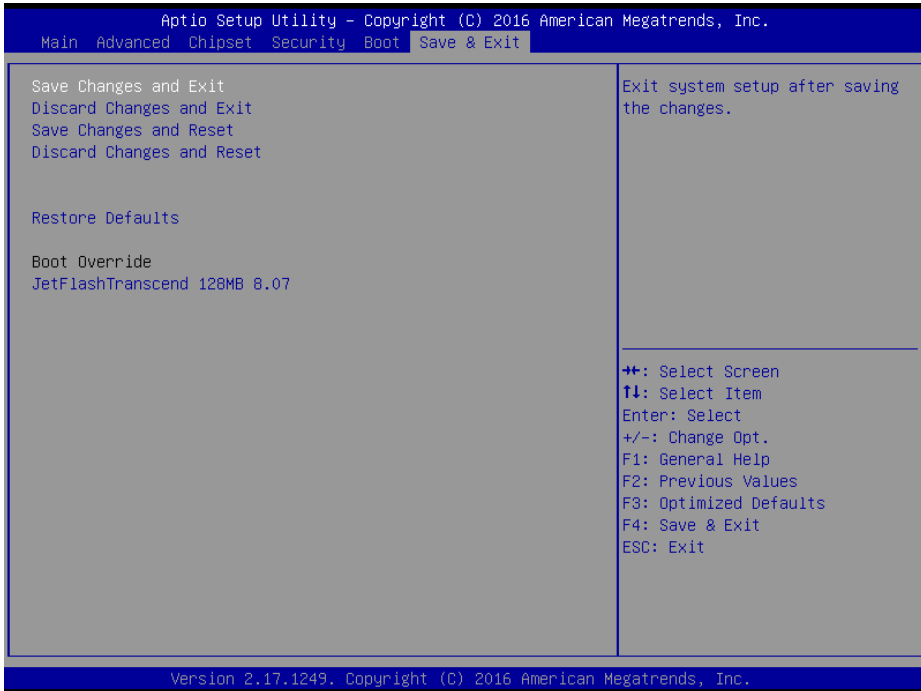
Save & Exit Screen

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

3-5. WATCHDOG TIMER CONFIGURATION

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).

3-5-1.   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.

3-5-2. Code Example for Watchdog Timer

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

```
;------ Enter to extended function mode --------------------------------------------------
mov     dx,     2eh
mov     al,     87h
out     dx,     al
out     dx,     al
;------ Select Logical Device 7 of watchdog timer ------------------------------------------
-
mov     al,     07h
out     dx,     al
inc     dx
mov     al,     07h
out     dx,     al
;------ Enable Watch dog feature -----------------------------------------------------------
mov     al,     030h
out     dx,     al
inc     dx
mov     al,     01h
out     dx,     al
;------ Enable Watch PME--------------------------------------------------------------------
dec     dx
mov     al,     0FAh
out     dx,     al
inc     dx
in      al,     dx
and     al,     51h
out     dx,     al
;------ Set second as counting unit --------------------------------------------------------
dec     dx
mov     al,     0f5h
out     dx,     al
inc     dx
in      al,     dx
and     al,     30h
out     dx,     al
;------ Set timeout interval as 30seconds and start counting --------------------------------
dec     dx
mov     al,     0f6h
out     dx,     al
inc     dx
```

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

3-6. BIOS UPDATE INSTRUCTIONS

3-6-1. Before System BIOS UPDATE

1. Prepare a bootable media (e.g. USB storage device) which can boot the system to DOS prompt.
2. Download and save the BIOS file (e.g. 62253PD5.bin) to the bootable device.
3. Copy AMI flash utility – AFUDOS.exe (V5.07) into the bootable device.
4. Make sure the target system can first boot to the bootable device.
   a. Connect the bootable USB device.
   b. Turn on the computer and press <Del> or <Esc> key during boot to enter BIOS setup menu.
   c. System will go into the BIOS setup menu.
   d. Select [Boot] menu as the picture shown below.
   e. Select [Hard Drive BBS Priorities] and set the USB bootable device as the 1st boot device.
   f. Press <F4> key to save the configuration and exit the BIOS setup menu.
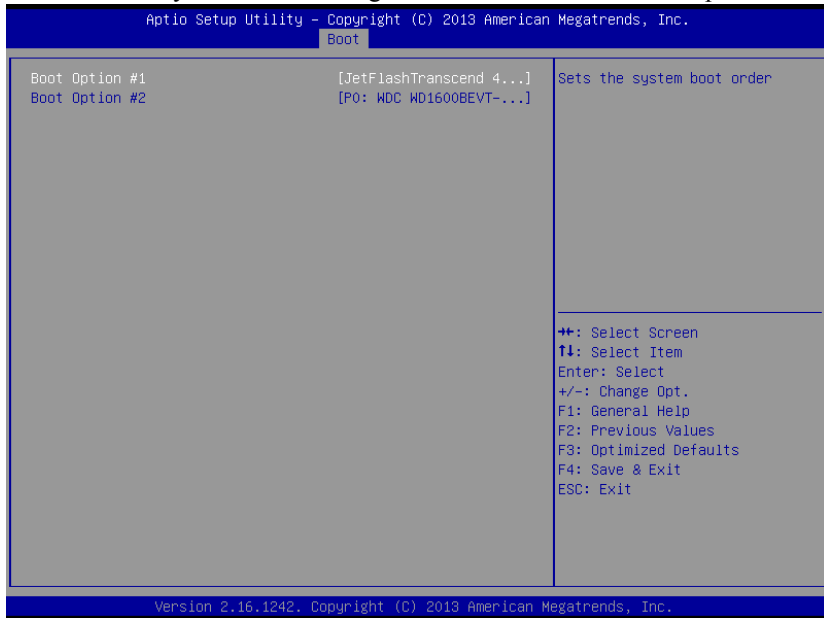
3-6-2. AFUDOS Command for System BIOS Update

AFUDOS.exe is aforementioned AMI firmware update utility. The command line is shown below:

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

You can type AFUDOS /? to view the definition of each control option. The recommended options for BIOS ROM update consist of the following parameters:

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

3-6-3. BIOS Update Procedure

1. Use the bootable USB device to boot up the system into the MS-DOS command prompt.
2. Type in AFUDOS 6225xxxx.bin /p /b /n /x and press **Enter** to start the flash procedure.
   Note: xxxx means the BIOS revision part, e.g. 0PD5…
3. During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off or reset your computer before the update is completed, or it may crash the BIOS ROM and the system will be unable to boot up next time. The whole update process may take up to 3 minutes.
4. After BIOS update procedures is completed, the following messages will be displayed:

```
+------------------------------------------------------------------------+
¦               AMI Fireware Update Utility  v5.07.01                     ¦
¦      Copyright (C)2014 American Megatrends Inc. All Rights Reserved.    ¦
+------------------------------------------------------------------------+
 Reading flash .............. done
 - ME Data Size checking . ok
 - FFS checksums ........ ok
 Erasing Boot Block ......... done
 Updating Boot Block ........ done
 Verifying Boot Block ....... done
 Erasing Main Block ......... done
 Updating Main Block ........ done
 Verifying Main Block ....... done
 Erasing NVRAM Block ........ done
 Updating NVRAM Block ....... done
 Verifying NVRAM Block ...... done

C:\AFUDOS>
```

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

```
Version 2.18.1249. Copyright (C) 2018 American Megatrends, Inc.
BIOS Date: 11/20/2018 10:31:35 Ver: 62253PD5
Press <DEL> or <ESC> to enter setup.
```

3-7. SYSTEM RESOURCE MAP

3-7-1. Interrupt Map

IRQ	ASSIGNMENT
0	System timer
1	Standard PS/2 Keyboard
3	Communications Port (COM2)
4	Communications Port (COM1)
5	Printer Port (LPT1)
7	Communications Port (COM3)
7	Communications Port (COM4)
8	High precision event timer
16	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 1 - 0F48
17	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 2 - 0F4A
18	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 3 - 0F4C
19	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 4 - 0F4E
19	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
81	Microsoft ACPI-Compliant System
82	Microsoft ACPI-Compliant System
83	Microsoft ACPI-Compliant System
84	Microsoft ACPI-Compliant System
85	Microsoft ACPI-Compliant System
86	Microsoft ACPI-Compliant System
87	Microsoft ACPI-Compliant System
88	Microsoft ACPI-Compliant System
89	Microsoft ACPI-Compliant System
90	Microsoft ACPI-Compliant System
91	Microsoft ACPI-Compliant System
92	Microsoft ACPI-Compliant System
93	Microsoft ACPI-Compliant System
94	Microsoft ACPI-Compliant System
95	Microsoft ACPI-Compliant System
96	Microsoft ACPI-Compliant System
97	Microsoft ACPI-Compliant System
98	Microsoft ACPI-Compliant System
99	Microsoft ACPI-Compliant System
100	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
101	Microsoft ACPI-Compliant System
102	Microsoft ACPI-Compliant System
103	Microsoft ACPI-Compliant System
104	Microsoft ACPI-Compliant System
105	Microsoft ACPI-Compliant System
106	Microsoft ACPI-Compliant System
107	Microsoft ACPI-Compliant System
108	Microsoft ACPI-Compliant System
109	Microsoft ACPI-Compliant System
110	Microsoft ACPI-Compliant System
111	Microsoft ACPI-Compliant System
112	Microsoft ACPI-Compliant System
113	Microsoft ACPI-Compliant System
114	Microsoft ACPI-Compliant System
115	Microsoft ACPI-Compliant System
116	Microsoft ACPI-Compliant System
117	Microsoft ACPI-Compliant System
118	Microsoft ACPI-Compliant System
119	Microsoft ACPI-Compliant System
120	Microsoft ACPI-Compliant System
121	Microsoft ACPI-Compliant System
122	Microsoft ACPI-Compliant System
123	Microsoft ACPI-Compliant System
124	Microsoft ACPI-Compliant System
125	Microsoft ACPI-Compliant System
126	Microsoft ACPI-Compliant System
127	Microsoft ACPI-Compliant System
128	Microsoft ACPI-Compliant System
129	Microsoft ACPI-Compliant System
130	Microsoft ACPI-Compliant System
131	Microsoft ACPI-Compliant System
132	Microsoft ACPI-Compliant System
133	Microsoft ACPI-Compliant System
134	Microsoft ACPI-Compliant System
135	Microsoft ACPI-Compliant System
136	Microsoft ACPI-Compliant System
137	Microsoft ACPI-Compliant System
138	Microsoft ACPI-Compliant System
139	Microsoft ACPI-Compliant System
140	Microsoft ACPI-Compliant System
141	Microsoft ACPI-Compliant System
142	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
143	Microsoft ACPI-Compliant System
144	Microsoft ACPI-Compliant System
145	Microsoft ACPI-Compliant System
146	Microsoft ACPI-Compliant System
147	Microsoft ACPI-Compliant System
148	Microsoft ACPI-Compliant System
149	Microsoft ACPI-Compliant System
150	Microsoft ACPI-Compliant System
151	Microsoft ACPI-Compliant System
152	Microsoft ACPI-Compliant System
153	Microsoft ACPI-Compliant System
154	Microsoft ACPI-Compliant System
155	Microsoft ACPI-Compliant System
156	Microsoft ACPI-Compliant System
157	Microsoft ACPI-Compliant System
158	Microsoft ACPI-Compliant System
159	Microsoft ACPI-Compliant System
160	Microsoft ACPI-Compliant System
161	Microsoft ACPI-Compliant System
162	Microsoft ACPI-Compliant System
163	Microsoft ACPI-Compliant System
164	Microsoft ACPI-Compliant System
165	Microsoft ACPI-Compliant System
166	Microsoft ACPI-Compliant System
167	Microsoft ACPI-Compliant System
168	Microsoft ACPI-Compliant System
169	Microsoft ACPI-Compliant System
170	Microsoft ACPI-Compliant System
171	Microsoft ACPI-Compliant System
172	Microsoft ACPI-Compliant System
173	Microsoft ACPI-Compliant System
174	Microsoft ACPI-Compliant System
175	Microsoft ACPI-Compliant System
176	Microsoft ACPI-Compliant System
177	Microsoft ACPI-Compliant System
178	Microsoft ACPI-Compliant System
179	Microsoft ACPI-Compliant System
180	Microsoft ACPI-Compliant System
181	Microsoft ACPI-Compliant System
182	Microsoft ACPI-Compliant System
183	Microsoft ACPI-Compliant System
184	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
185	Microsoft ACPI-Compliant System
186	Microsoft ACPI-Compliant System
187	Microsoft ACPI-Compliant System
188	Microsoft ACPI-Compliant System
189	Microsoft ACPI-Compliant System
190	Microsoft ACPI-Compliant System
191	Microsoft ACPI-Compliant System
256	Microsoft ACPI-Compliant System
257	Microsoft ACPI-Compliant System
258	Microsoft ACPI-Compliant System
259	Microsoft ACPI-Compliant System
260	Microsoft ACPI-Compliant System
261	Microsoft ACPI-Compliant System
262	Microsoft ACPI-Compliant System
263	Microsoft ACPI-Compliant System
264	Microsoft ACPI-Compliant System
265	Microsoft ACPI-Compliant System
266	Microsoft ACPI-Compliant System
267	Microsoft ACPI-Compliant System
268	Microsoft ACPI-Compliant System
269	Microsoft ACPI-Compliant System
270	Microsoft ACPI-Compliant System
271	Microsoft ACPI-Compliant System
272	Microsoft ACPI-Compliant System
273	Microsoft ACPI-Compliant System
274	Microsoft ACPI-Compliant System
275	Microsoft ACPI-Compliant System
276	Microsoft ACPI-Compliant System
277	Microsoft ACPI-Compliant System
278	Microsoft ACPI-Compliant System
279	Microsoft ACPI-Compliant System
280	Microsoft ACPI-Compliant System
281	Microsoft ACPI-Compliant System
282	Microsoft ACPI-Compliant System
283	Microsoft ACPI-Compliant System
284	Microsoft ACPI-Compliant System
285	Microsoft ACPI-Compliant System
286	Microsoft ACPI-Compliant System
287	Microsoft ACPI-Compliant System
288	Microsoft ACPI-Compliant System
289	Microsoft ACPI-Compliant System
290	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
291	Microsoft ACPI-Compliant System
292	Microsoft ACPI-Compliant System
293	Microsoft ACPI-Compliant System
294	Microsoft ACPI-Compliant System
295	Microsoft ACPI-Compliant System
296	Microsoft ACPI-Compliant System
297	Microsoft ACPI-Compliant System
298	Microsoft ACPI-Compliant System
299	Microsoft ACPI-Compliant System
300	Microsoft ACPI-Compliant System
301	Microsoft ACPI-Compliant System
302	Microsoft ACPI-Compliant System
303	Microsoft ACPI-Compliant System
304	Microsoft ACPI-Compliant System
305	Microsoft ACPI-Compliant System
306	Microsoft ACPI-Compliant System
307	Microsoft ACPI-Compliant System
308	Microsoft ACPI-Compliant System
309	Microsoft ACPI-Compliant System
310	Microsoft ACPI-Compliant System
311	Microsoft ACPI-Compliant System
312	Microsoft ACPI-Compliant System
313	Microsoft ACPI-Compliant System
314	Microsoft ACPI-Compliant System
315	Microsoft ACPI-Compliant System
316	Microsoft ACPI-Compliant System
317	Microsoft ACPI-Compliant System
318	Microsoft ACPI-Compliant System
319	Microsoft ACPI-Compliant System
320	Microsoft ACPI-Compliant System
321	Microsoft ACPI-Compliant System
322	Microsoft ACPI-Compliant System
323	Microsoft ACPI-Compliant System
324	Microsoft ACPI-Compliant System
325	Microsoft ACPI-Compliant System
326	Microsoft ACPI-Compliant System
327	Microsoft ACPI-Compliant System
328	Microsoft ACPI-Compliant System
329	Microsoft ACPI-Compliant System
330	Microsoft ACPI-Compliant System
331	Microsoft ACPI-Compliant System
332	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
333	Microsoft ACPI-Compliant System
334	Microsoft ACPI-Compliant System
335	Microsoft ACPI-Compliant System
336	Microsoft ACPI-Compliant System
337	Microsoft ACPI-Compliant System
338	Microsoft ACPI-Compliant System
339	Microsoft ACPI-Compliant System
340	Microsoft ACPI-Compliant System
341	Microsoft ACPI-Compliant System
342	Microsoft ACPI-Compliant System
343	Microsoft ACPI-Compliant System
344	Microsoft ACPI-Compliant System
345	Microsoft ACPI-Compliant System
346	Microsoft ACPI-Compliant System
347	Microsoft ACPI-Compliant System
348	Microsoft ACPI-Compliant System
349	Microsoft ACPI-Compliant System
350	Microsoft ACPI-Compliant System
351	Microsoft ACPI-Compliant System
352	Microsoft ACPI-Compliant System
353	Microsoft ACPI-Compliant System
354	Microsoft ACPI-Compliant System
355	Microsoft ACPI-Compliant System
356	Microsoft ACPI-Compliant System
357	Microsoft ACPI-Compliant System
358	Microsoft ACPI-Compliant System
359	Microsoft ACPI-Compliant System
360	Microsoft ACPI-Compliant System
361	Microsoft ACPI-Compliant System
362	Microsoft ACPI-Compliant System
363	Microsoft ACPI-Compliant System
364	Microsoft ACPI-Compliant System
365	Microsoft ACPI-Compliant System
366	Microsoft ACPI-Compliant System
367	Microsoft ACPI-Compliant System
368	Microsoft ACPI-Compliant System
369	Microsoft ACPI-Compliant System
370	Microsoft ACPI-Compliant System
371	Microsoft ACPI-Compliant System
372	Microsoft ACPI-Compliant System
373	Microsoft ACPI-Compliant System
374	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
375	Microsoft ACPI-Compliant System
376	Microsoft ACPI-Compliant System
377	Microsoft ACPI-Compliant System
378	Microsoft ACPI-Compliant System
379	Microsoft ACPI-Compliant System
380	Microsoft ACPI-Compliant System
381	Microsoft ACPI-Compliant System
382	Microsoft ACPI-Compliant System
383	Microsoft ACPI-Compliant System
384	Microsoft ACPI-Compliant System
385	Microsoft ACPI-Compliant System
386	Microsoft ACPI-Compliant System
387	Microsoft ACPI-Compliant System
388	Microsoft ACPI-Compliant System
389	Microsoft ACPI-Compliant System
390	Microsoft ACPI-Compliant System
391	Microsoft ACPI-Compliant System
392	Microsoft ACPI-Compliant System
393	Microsoft ACPI-Compliant System
394	Microsoft ACPI-Compliant System
395	Microsoft ACPI-Compliant System
396	Microsoft ACPI-Compliant System
397	Microsoft ACPI-Compliant System
398	Microsoft ACPI-Compliant System
399	Microsoft ACPI-Compliant System
400	Microsoft ACPI-Compliant System
401	Microsoft ACPI-Compliant System
402	Microsoft ACPI-Compliant System
403	Microsoft ACPI-Compliant System
404	Microsoft ACPI-Compliant System
405	Microsoft ACPI-Compliant System
406	Microsoft ACPI-Compliant System
407	Microsoft ACPI-Compliant System
408	Microsoft ACPI-Compliant System
409	Microsoft ACPI-Compliant System
410	Microsoft ACPI-Compliant System
411	Microsoft ACPI-Compliant System
412	Microsoft ACPI-Compliant System
413	Microsoft ACPI-Compliant System
414	Microsoft ACPI-Compliant System
415	Microsoft ACPI-Compliant System
416	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
417	Microsoft ACPI-Compliant System
418	Microsoft ACPI-Compliant System
419	Microsoft ACPI-Compliant System
420	Microsoft ACPI-Compliant System
421	Microsoft ACPI-Compliant System
422	Microsoft ACPI-Compliant System
423	Microsoft ACPI-Compliant System
424	Microsoft ACPI-Compliant System
425	Microsoft ACPI-Compliant System
426	Microsoft ACPI-Compliant System
427	Microsoft ACPI-Compliant System
428	Microsoft ACPI-Compliant System
429	Microsoft ACPI-Compliant System
430	Microsoft ACPI-Compliant System
431	Microsoft ACPI-Compliant System
432	Microsoft ACPI-Compliant System
433	Microsoft ACPI-Compliant System
434	Microsoft ACPI-Compliant System
435	Microsoft ACPI-Compliant System
436	Microsoft ACPI-Compliant System
437	Microsoft ACPI-Compliant System
438	Microsoft ACPI-Compliant System
439	Microsoft ACPI-Compliant System
440	Microsoft ACPI-Compliant System
441	Microsoft ACPI-Compliant System
442	Microsoft ACPI-Compliant System
443	Microsoft ACPI-Compliant System
444	Microsoft ACPI-Compliant System
445	Microsoft ACPI-Compliant System
446	Microsoft ACPI-Compliant System
447	Microsoft ACPI-Compliant System
448	Microsoft ACPI-Compliant System
449	Microsoft ACPI-Compliant System
450	Microsoft ACPI-Compliant System
451	Microsoft ACPI-Compliant System
452	Microsoft ACPI-Compliant System
453	Microsoft ACPI-Compliant System
454	Microsoft ACPI-Compliant System
455	Microsoft ACPI-Compliant System
456	Microsoft ACPI-Compliant System
457	Microsoft ACPI-Compliant System
458	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
459	Microsoft ACPI-Compliant System
460	Microsoft ACPI-Compliant System
461	Microsoft ACPI-Compliant System
462	Microsoft ACPI-Compliant System
463	Microsoft ACPI-Compliant System
464	Microsoft ACPI-Compliant System
465	Microsoft ACPI-Compliant System
466	Microsoft ACPI-Compliant System
467	Microsoft ACPI-Compliant System
468	Microsoft ACPI-Compliant System
469	Microsoft ACPI-Compliant System
470	Microsoft ACPI-Compliant System
471	Microsoft ACPI-Compliant System
472	Microsoft ACPI-Compliant System
473	Microsoft ACPI-Compliant System
474	Microsoft ACPI-Compliant System
475	Microsoft ACPI-Compliant System
476	Microsoft ACPI-Compliant System
477	Microsoft ACPI-Compliant System
478	Microsoft ACPI-Compliant System
479	Microsoft ACPI-Compliant System
480	Microsoft ACPI-Compliant System
481	Microsoft ACPI-Compliant System
482	Microsoft ACPI-Compliant System
483	Microsoft ACPI-Compliant System
484	Microsoft ACPI-Compliant System
485	Microsoft ACPI-Compliant System
486	Microsoft ACPI-Compliant System
487	Microsoft ACPI-Compliant System
488	Microsoft ACPI-Compliant System
489	Microsoft ACPI-Compliant System
490	Microsoft ACPI-Compliant System
491	Microsoft ACPI-Compliant System
492	Microsoft ACPI-Compliant System
493	Microsoft ACPI-Compliant System
494	Microsoft ACPI-Compliant System
495	Microsoft ACPI-Compliant System
496	Microsoft ACPI-Compliant System
497	Microsoft ACPI-Compliant System
498	Microsoft ACPI-Compliant System
499	Microsoft ACPI-Compliant System
500	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
501	Microsoft ACPI-Compliant System
502	Microsoft ACPI-Compliant System
503	Microsoft ACPI-Compliant System
504	Microsoft ACPI-Compliant System
505	Microsoft ACPI-Compliant System
506	Microsoft ACPI-Compliant System
507	Microsoft ACPI-Compliant System
508	Microsoft ACPI-Compliant System
509	Microsoft ACPI-Compliant System
510	Microsoft ACPI-Compliant System
511	Microsoft ACPI-Compliant System
4294967291	Intel$^®$ HD Graphics
4294967292	Intel$^®$ USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
4294967293	Intel$^®$ Trusted Execution Engine Interface
4294967294	Realtek PCIe GBE Family Controller

3-7-2. DMA Channels Map

TIMER CHANNEL	ASSIGNMENT
Channel 4	Direct memory access controller

3-7-3. I/O Map

I/O MAP	ASSIGNMENT
0x00000000-0x0000006F	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
0x00000078-0x00000CF7	PCI Express Root Complex
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000378-0x0000037F	Printer Port (LPT1)
0x000003B0-0x000003BB	Intel® HD Graphics
0x000003C0-0x000003DF	Intel® HD Graphics
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)

I/O MAP	ASSIGNMENT
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000164E-0x0000164F	Motherboard resources
0x0000E000-0x0000E0FF	Realtek PCIe GBE Family Controller
0x0000E000-0x0000E0FF	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 4 - 0F4E
0x0000F000-0x0000F01F	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series Platform Control Unit - SMBus Port - 0F12
0x0000F020-0x0000F03F	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0x0000F040-0x0000F043	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0x0000F050-0x0000F057	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0x0000F060-0x0000F063	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0x0000F070-0x0000F077	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0x0000F080-0x0000F087	Intel® HD Graphics

3-7-4. Memory Map

MEMORY MAP	ASSIGNMENT
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xD0604000-0xD0604FFF	Realtek PCIe GBE Family Controller
0xD0600000-0xD0603FFF	Realtek PCIe GBE Family Controller
0xD0600000-0xD0603FFF	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series PCI Express - Root Port 4 - 0F4E
0xFED00000-0xFED003FF	High precision event timer
0xC0000000-0xD0711FFE	PCI Express Root Complex
0xC0000000-0xD0711FFE	Intel® HD Graphics
0xD0000000-0xD03FFFFF	Intel® HD Graphics
0xD0700000-0xD070FFFF	Intel® USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
0xD0710000-0xD071001F	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series Platform Control Unit - SMBus Port - 0F12
0xD0500000-0xD05FFFFF	Intel® Trusted Execution Engine Interface
0xD0400000-0xD04FFFFF	Intel® Trusted Execution Engine Interface
0xD0711000-0xD07117FF	Intel® Pentium® processor N- and J-series / Intel® Celeron® processor N- and J-series AHCI - 0F23
0xE00000D0-0xE00000DB	Intel® Sideband Fabric Device
0xFF000000-0xFFFFFFFF	Intel® 82802 Firmware Hub Device
0xA0000-0xBFFFF	PCI Express Root Complex
0xA0000-0xBFFFF	Intel® HD Graphics
0xC0000-0xDFFFF	PCI Express Root Complex
0xE0000-0xFFFFF	PCI Express Root Complex

SYSTEM DIAGRAMS

This appendix contains exploded diagrams and part numbers of the PA-6222 system.

Sections included:

- Exploded Diagram for Panel PC
  - Cable Cover
  - Storage
  - Back Cover
  - Touchscreen & LCD Panel
  - Inside Case
- Exploded Diagram for Peripheral Devices
  - MSR
  - 2nd Display
- Exploded Diagram for Stand
  - Stand
- Exploded Diagram for Packing
  - PPC Packing
  - POS Packing

EXPLODED DIAGRAM FOR CABLE COVER
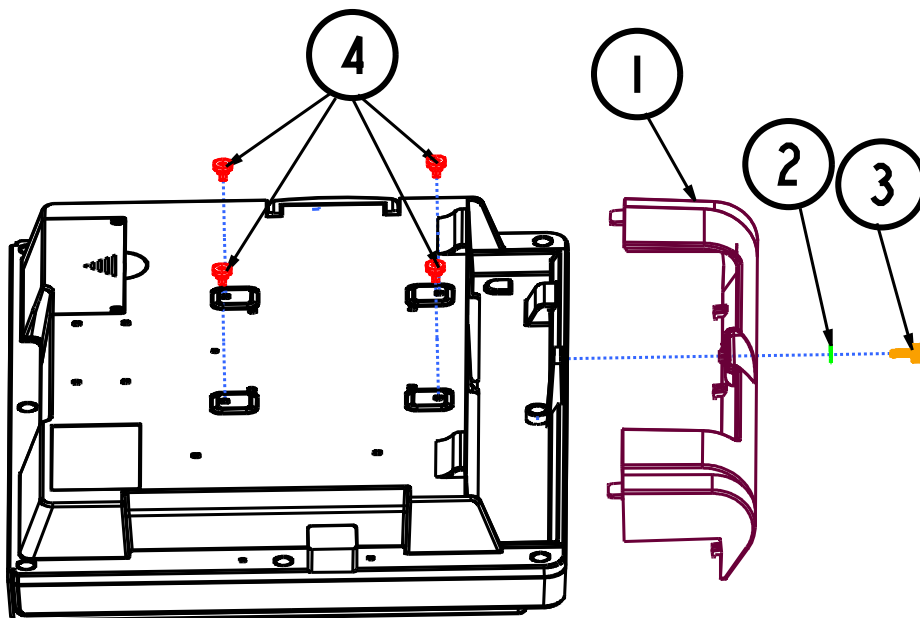
NO.	Component Name	Part No.	Q´ty
1	PA-6222_CABLE_COVER	30-002-28110335	1
2	KYWS-3	23-220-25050089	1
3	hand screw	22-285-30010011	1
4	FILLISTR HEAD SCREW M4x0.7Px4mm	22-272-40004911	4

EXPLODED DIAGRAM FOR STORAGE
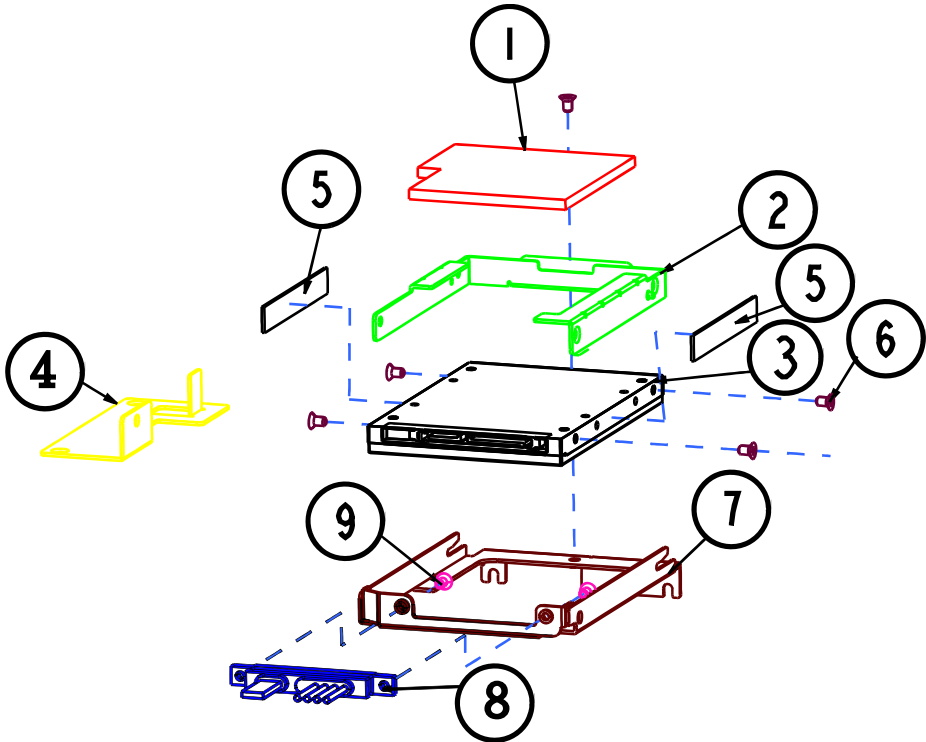
NO	Component Name	Part No.	Q´ty
1	THERMAL_PAD	81-006-86865001	1
2	6222_HDD_TRACK	20-039-03001335	1
3	HDD	XX-XXX-XXXXXXXX	1
4	HDD_SHAFT_PLATE_LEFT	20-005-03003335	1
5	PRON_W8_HDD_EVA	30-013-15100335	2
6	FLAT HEAD SCREW M3_L5	22-212-30050011	5
7	PA-6222_HDD_CHASSIC	20-015-03001335	1
8	HDD_CABLE	27-012-26905081	1
9	M3_L6_1_head	82-275-30006018	2

EXPLODED DIAGRAM FOR BACK COVER
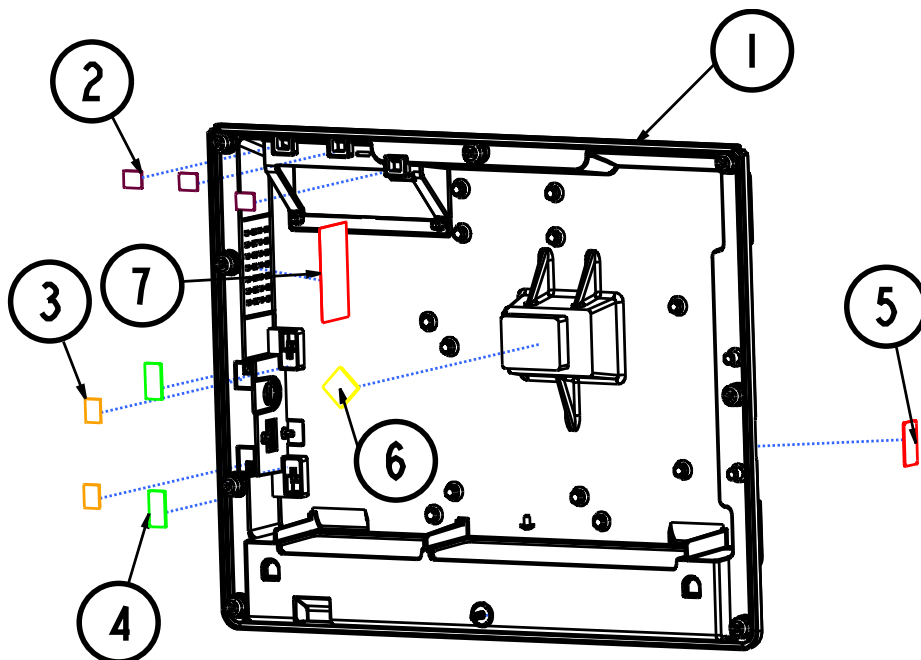
NO.	Component Name	Part No.	Q'ty
1	PA-6222_BACK_COVER	20-003-01061335	1
2	6222_HDD_COVER_MYLAR	30-056-02300335	3
3	6222_DOOR_BOT_MYLAR	30-056-02200335	2
4	6222_POWER_DOOR_MYLAR	30-056-02400335	2
5	MSR_HOLE_LABEL	94-017-02101269	1
6	THERMAL_15*15*1.5		1
7	SAATIFIL_ACOUSTEX_MESH	90-056-31100335	1
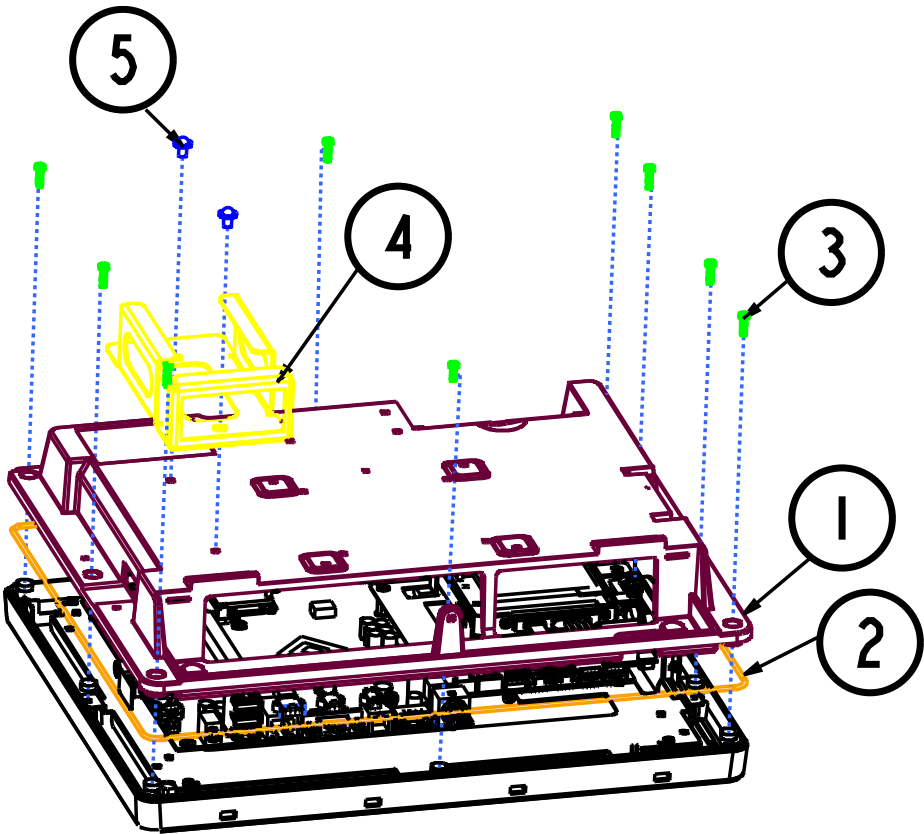
NO	Component Name	Part No.	Q'ty
1	PA-6222_BACK_COVER	20-003-01061335	1
2	PA-6222_PACKING	30-013-06200335	1
3	PAN HEAD SCREW	22-122-30080011	9
4	ADAPTER_HOLDER	20-029-07001274	1
5	M4_L6_FLAT	22-232-40006311	2
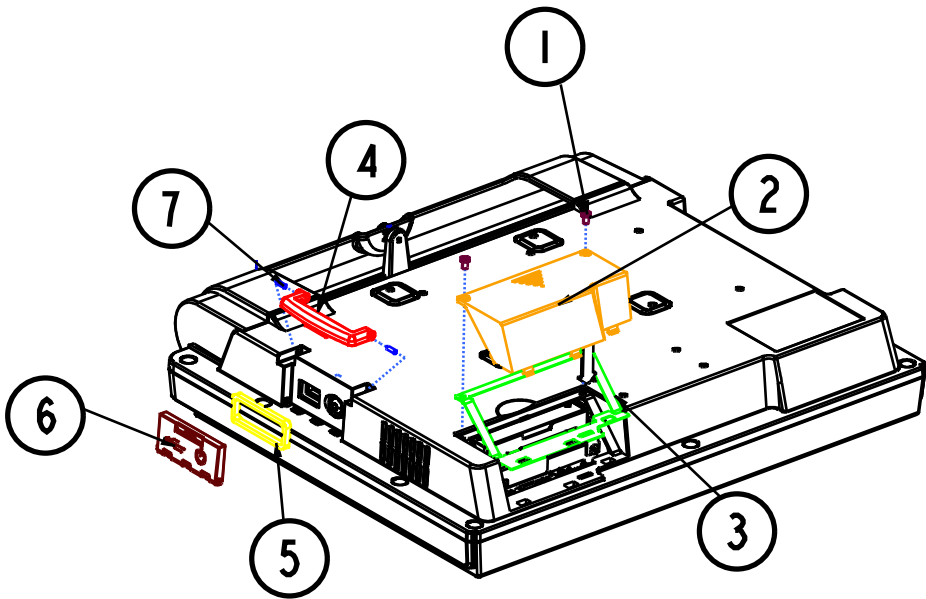
NO.	Component Name	Part No.	Q'ty
1	FILLISTR HEAD SCREW	82-275-30006018	2
2	PA-6222_HDD_COVER	30-002-28310335	1
3	6222_HDD_COVER_EVA	90-013-15200335	1
4	6222_DOOR_LOCK_SECOND	30-019-28110335	1
5	PA-6222_DOOR_EVA2	90-013-15100335	1
6	PA-6222_DOOR_PRT	30-007-28110335	1
7	PA-6222_DOOR_PIN	22-000-20007005	2

EXPLODED DIAGRAM FOR LCD & TOUCH PANEL
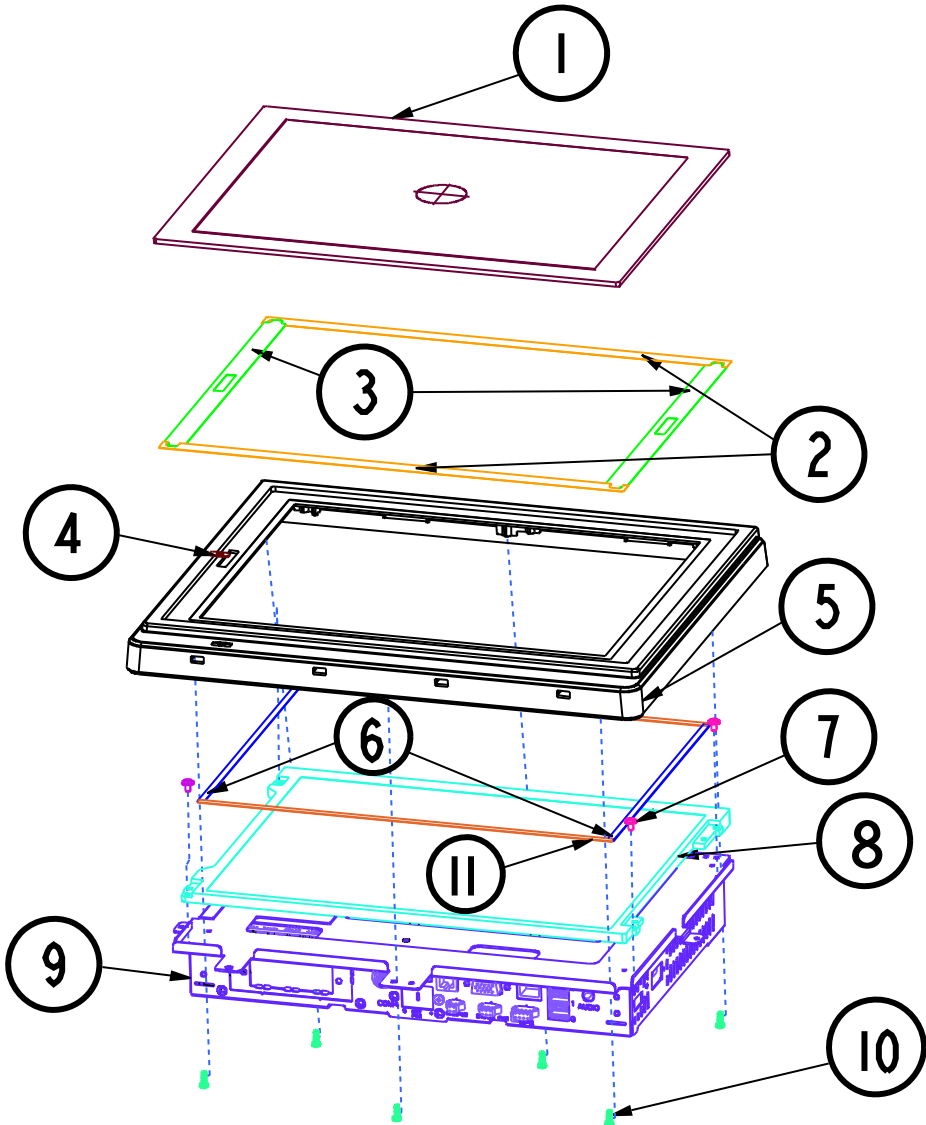
NO.	Component Name	Part No.	Q'ty
1	TOUCH PANEL	52-380-02310701	1
2	DOUBLE_COATED_TAPE_A	94-026-04901335	2
3	DOUBLE_COATED_TAPE_B	94-026-04902335	2
4	LED_DISPLAY	34-017-02101044	1
5	6222_FRONT_COVER_A	30-002-28210335	1
6	6012-LCD_PORON_LR	90-013-24100304	2
7	M3_L5_WASHER	22-242-30005311	4
8	AUO PANEL	52-351-02121102	1
9	6222_INSIDE_CASE_ASSY	20-001-03002335	1
10	D3_9_6_R_H_11	22-122-30080011	6
11	6012-LCD_PORON_TB	90-013-24200304	2

EXPLODED DIAGRAM FOR INSIDE CASE
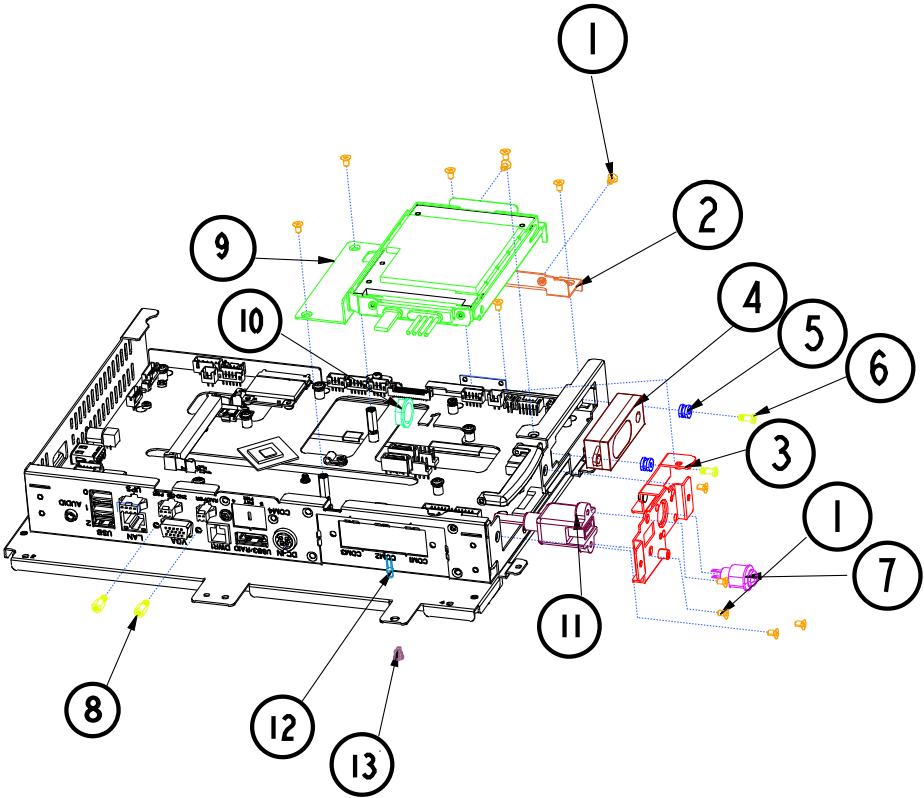
NO.	Component Name	Part No.	Q´ty
1	FLAT HEAD SCREWM3xL5	22-212-30050011	15
2	6222_HDD_INSIDE_CASE	20-001-03001335	1
3	HDD_SHAFT_PLATE	20-006-03001335	1
4	SPEAKER_BOX	13-500-06350118	1
5	SPEAKER_RUBBER	XX-XXX-XXXXXXXX	2
6	FILLISTER HEAD SCREW	22-272-30008015	2
7	SWITCH_CABLE	27-019-26904071	1
8	UNC No.4-40,L=4.8,H=7mm	22-692-40048051	2
9	PA-6222-HDD_ASSY	..	1
10	SWITCH_CABLE_NUT	..	1
11	USB CABLE	27-006-33506111	1
12	POWER LED CABLE	27-018-26906071	1
13	LED HOUSING	30-014-04100165	1
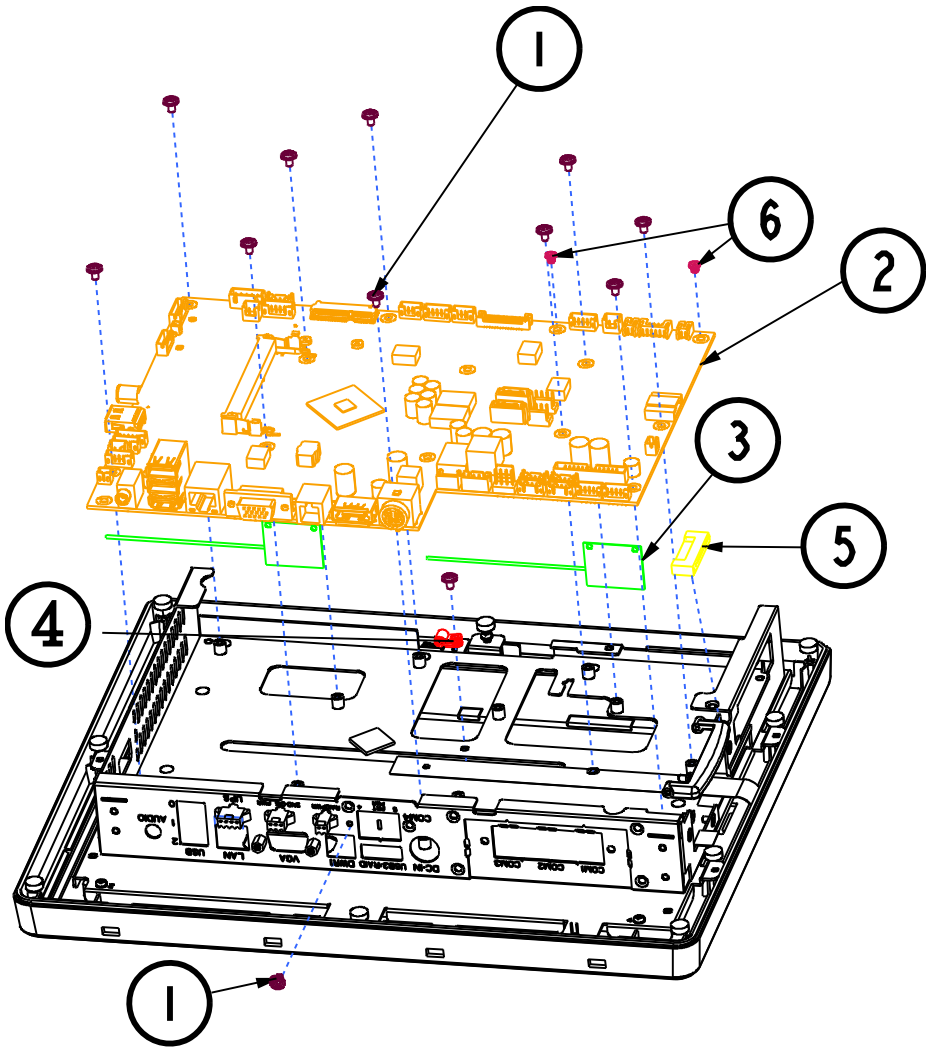
NO.	Component Name	Part No.	Q'ty
1	M3_L5_WASHER	22-242-30005311	11
2	MAIN BOARD	..	1
3	WIFI BOARD	..	2
4	CC-1	90-023-04800000	1
5	FCM-25SNQW	90-042-04200000	1
6	M3_1頭_L4_黑色_2號計_screw	22-272-30004318	2

EXPLODED DIAGRAM FOR MSR
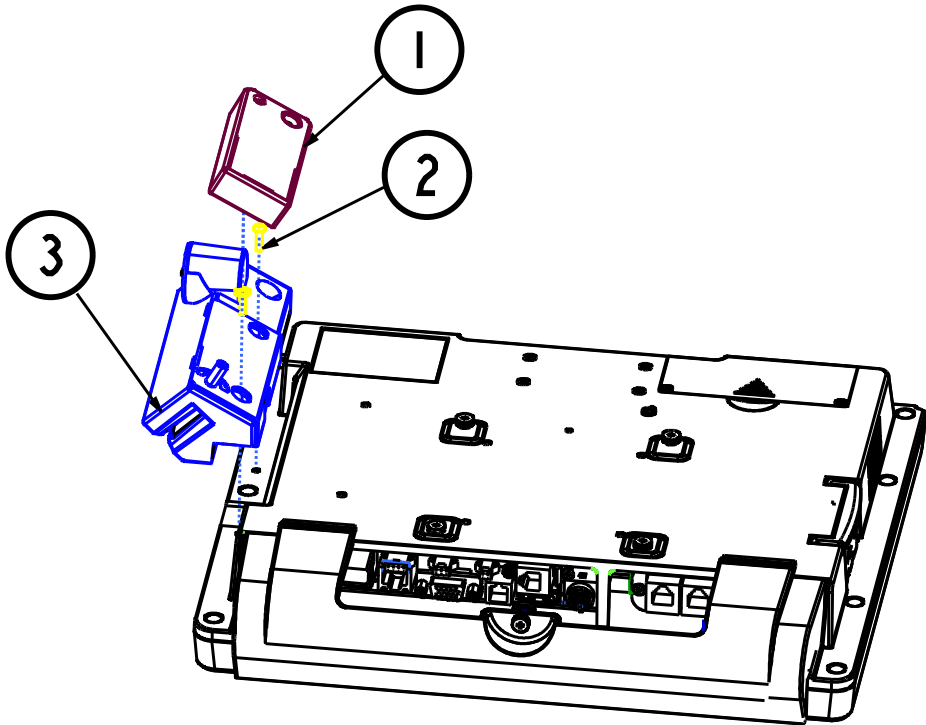
NO.	Component Name	Part No.	Q'ty
1	FINGER_PRINTER		1
2	SCREW_M3*L12		2
3	MSR		1
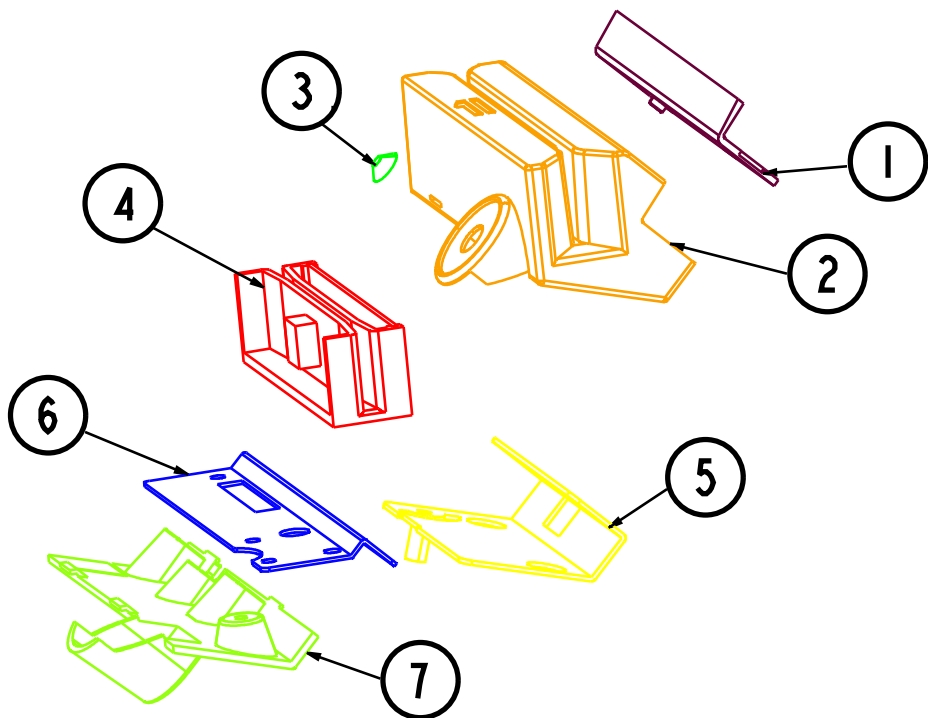
NO.	Component Name	Part No.	Q'ty
1	MSR_TOP_COVER_SIDE		1
2	MSR_TOP_COVER	30-014-12310210	1
3	MSR_BOTTOM_COVER_1		1
4	MSR_module		1
5	MSR_BRACKET		1
6	MSR_FIX_BRACKET	20-006-03006210	1
7	MSR_BOTTOM_COVER	30-002-12020210	1

EXPLODED DIAGRAM FOR SECOND DISPLAY
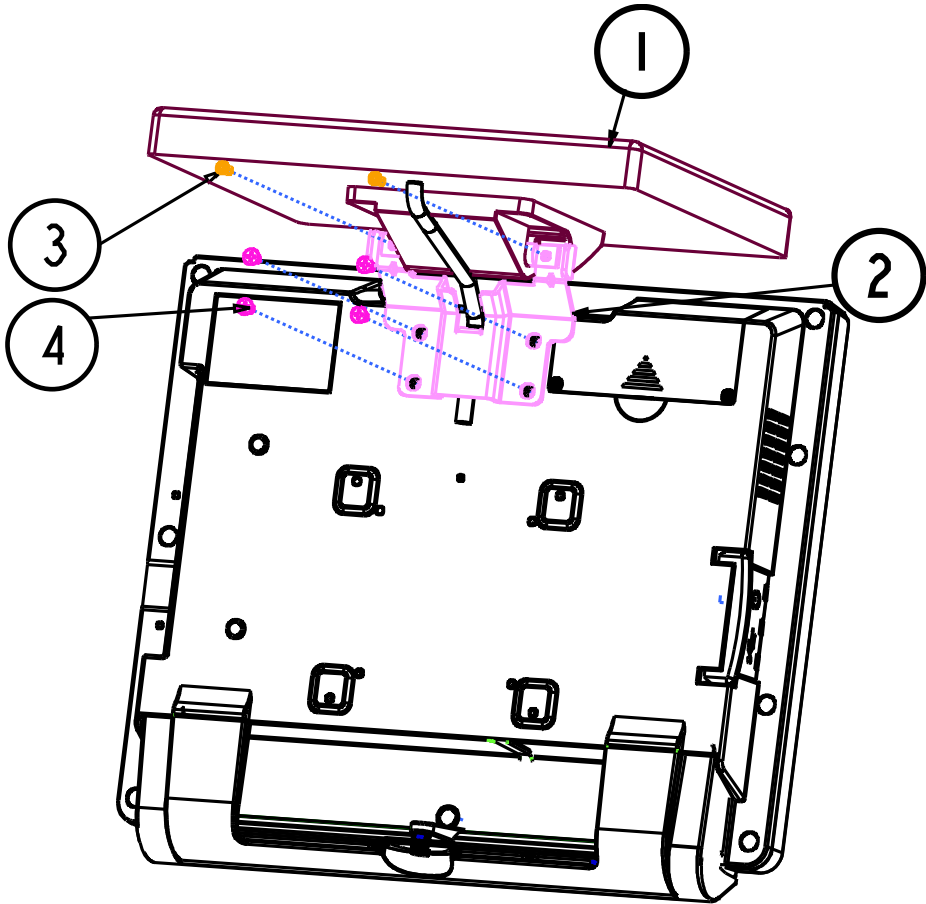
NO.	Component Name	Part No.	Q'ty
1	2ND_DISPLAY		1
2	2nd_DISPLAY_SUPPORT	80-006-03061226	1
3	SCREW_M4_L8	22-245-40008011	2
4	SCREW_M4_L8	22-215-40008711	4

EXPLODED DIAGRAM FOR STAND
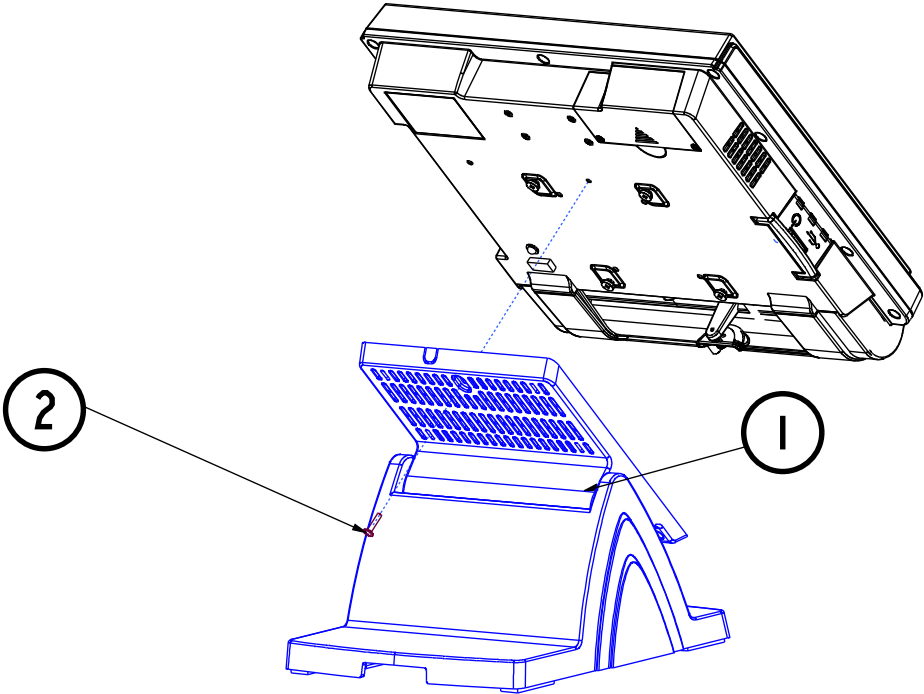
NO.	Component Name	Part No.	Q'ty
1	stand_all		1
2	SCREW_M3_L15	22-235-30015011	1
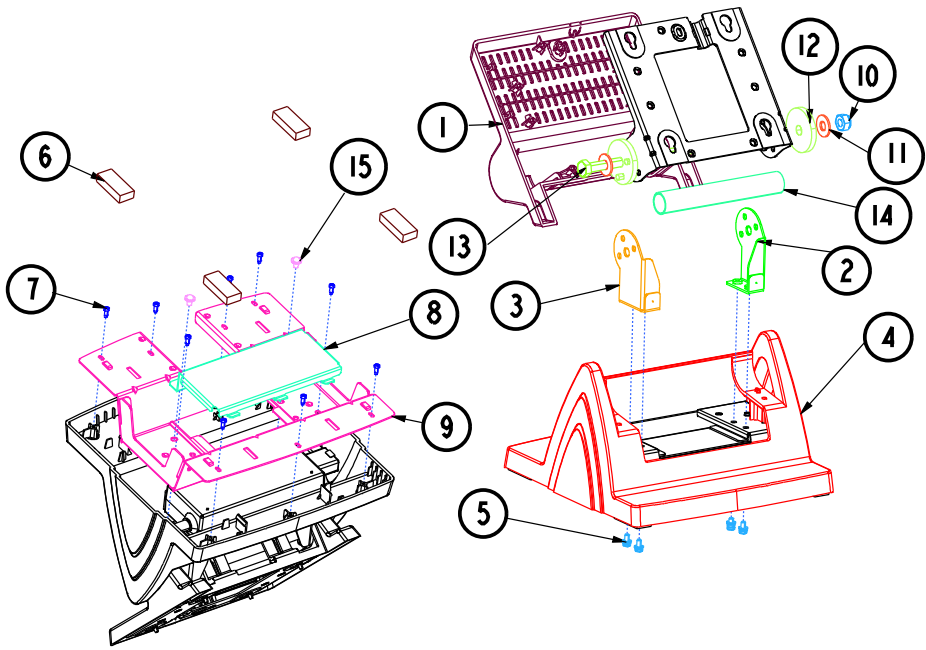
NO.	Component Name	Part No.	Q'ty
1	ROTATE_COVER	30-002-28610226	1
2	R_SUPPORT	80-002-03001226	1
3	L_SUPPORT	80-002-03002226	1
4	STAND_COVER	30-002-28710226	1
5	SCREW	22-232-40008211	4
6	RUBBER	30-004-01600000	4
7	SCREW	22-122-30080011	9
8	POWER_HOLDER	80-029-03001226	1
9	STAND_BASE	80-032-03001226	1
10	HEX_NUTS_M4_L7.85	23-142-80081291	1
11	PLAIN_WASHER_D8_D19_T1.5	23-202-08150191	2
12	HINGE_SPACER	30-041-04100139	2
13	HEX_SCREW_M8_L154	22-252-80154005	1
14	POS_6920_PIPE	80-056-02001226	1
15	M3*0.7P*6mm-washer	22-232-30006311	2

EXPLODED DIAGRAM FOR PPC PACKING
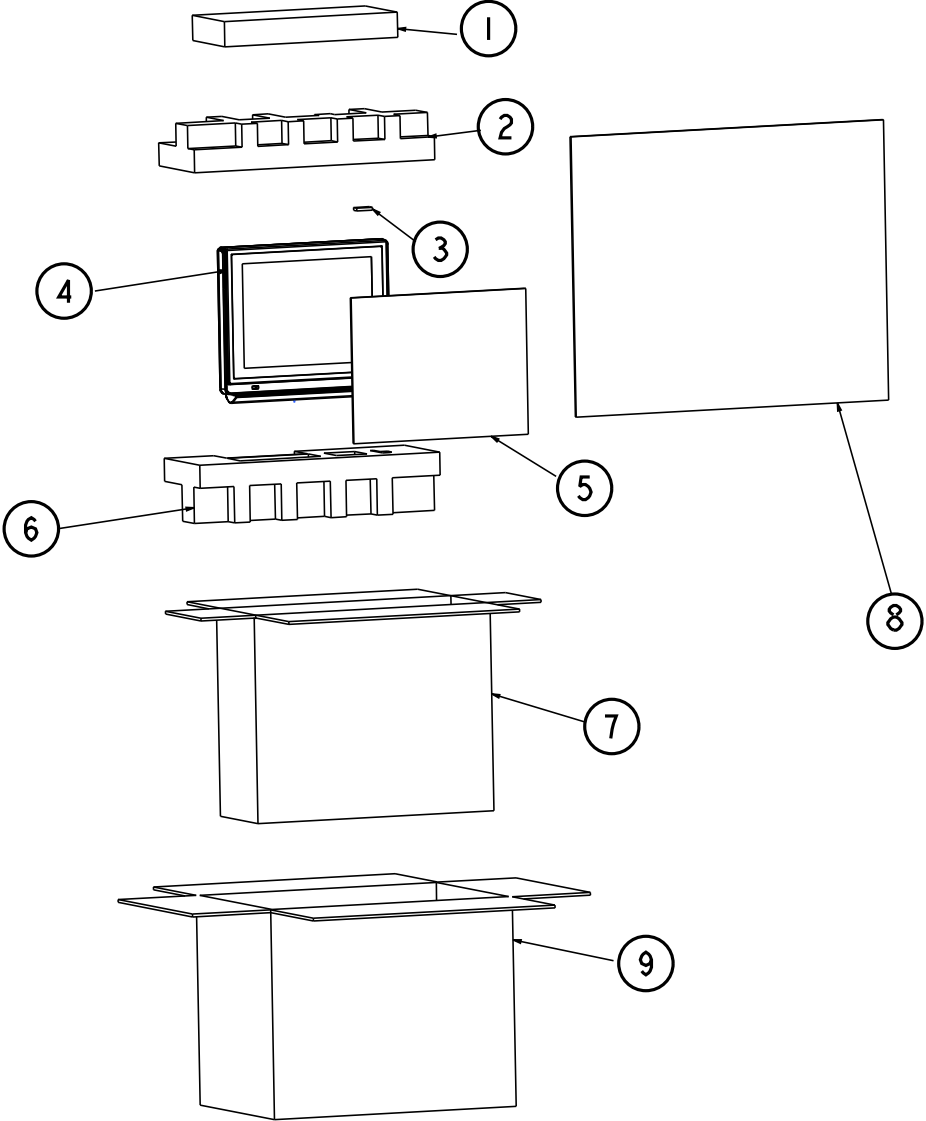
NO.	Component Name	Part No.	Q'ty
1	Accessories box	34-003-01301086	1
2	EPE_TOP	94-016-00301335	1
3	SILICA_GEL	34-005-00010007	1
4	PA-6222		1
5	MYLAR	30-056-02100008	1
6	EPE_DOWN	94-016-00302335	1
7	INNER_BOX	94-001-01301274	1
8	PE_BAG	32-100-20010000	1
9	OUTER_BOX	94-001-01401269	1

EXPLODED DIAGRAM FOR POS PACKING
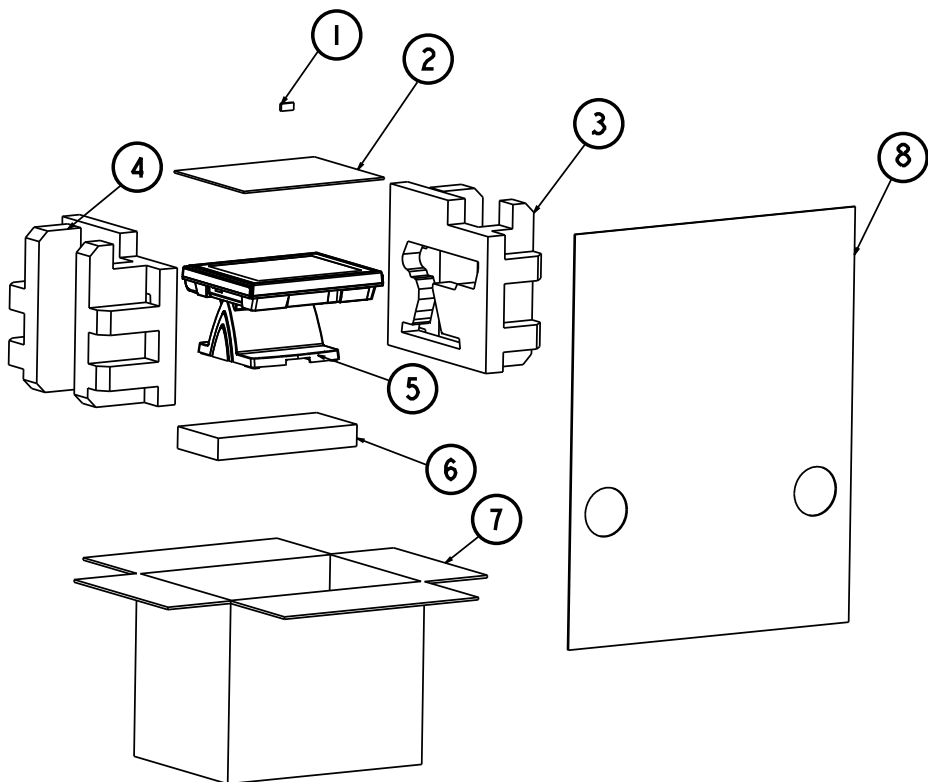
NO.	Component Name	Part No.	Q´ty
1	SILICA_GEL	34-005-00010007	1
2	MYLAR	30-056-02100008	1
3	EPE-6377L	94-016-00304335	1
4	EPE-6377R	94-016-00303335	1
5	PA-6222 with stand		1
6	Accessories box	34-003-01301086	1
7	OUTER_BOX	94-001-01401226	1
8	PE_bag	34-010-00210003	1

EXPLODED DIAGRAM FOR STAND PACKING
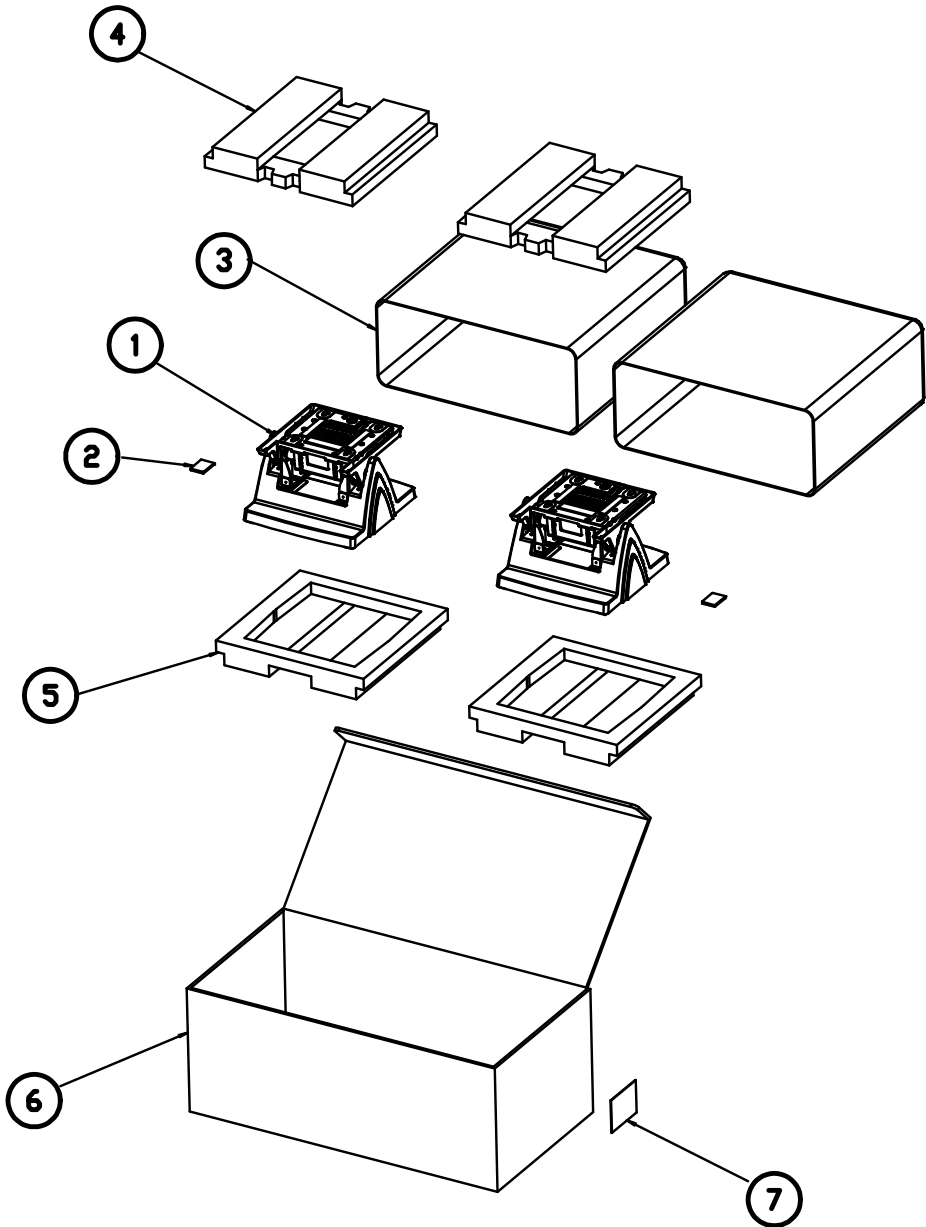
N°	Part Description	Part No.	Qty
1	Stand service pack for 120W adaptor	N/A	2
2	Silica gel	34-005-00010007	2
3	Package bag 480x460mm	32-100-20010000	2
4	EPE top 280x273x42mm	94-016-00303269	2
5	EPE bottom 280x273x42mm	94-016-00304269	2
6	Outer carton 592x308x229mm	94-001-01403269	1
7	Label	N/A	1