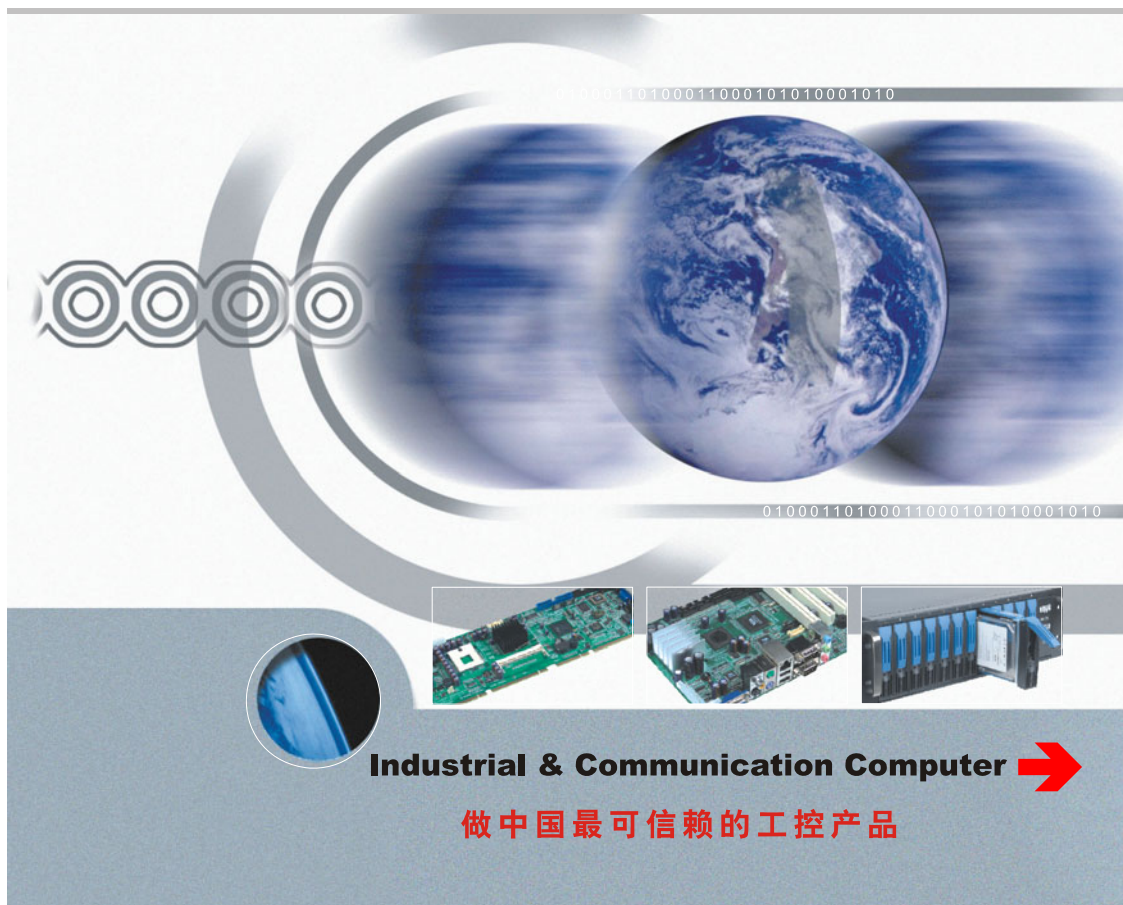




EMB-4922  
USER' Manual V1.0

# 用户手册

## USER'Manual



EMB-4922

USER' Manual V1.0

SZ HQ: 0755-27331166

Beijing: 010-82671166

Shanghai: 021-61212081

Chengdu: 028-85259319

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Xi'an: 029-88338386

Nanjing: 025-58015489

Wuhan: 027-87858983

Tianjin: 022-23727100

Singapore: 65-68530809

Netherlands: 31-040-2668554

For more information, please visit [www.norco-group.com](http://www.norco-group.com)

# Declaration of conformity



**Shenzhen NORCO Intelligent Technology Co.,Ltd.**

declares that the product


**EMB-4922 Digital Signage Motherboard**

(reference to the specification under which conformity is declared in accordance with 89/336 EEC-EMC Directive)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> EN 55022   | Limits and methods of measurements of radio disturbance<br>Characteristics of information technology equipment |
| <input checked="" type="checkbox"/> EN 50081-1 | Generic emission standard Part 1:<br>Residential, commercial and light industry                                |
| <input checked="" type="checkbox"/> EN 50082-1 | Generic immunity standard Part 1:<br>Residential, commercial and light industry                                |

**European Representative:**

**Shenzhen NORCO Intelligent Technology Co.,Ltd.**

Signature:  \_\_\_\_\_

Place/Date: HONG KONG/2012

Printed Name: Anders Cheung

Position/Title: President

# Declaration of conformity



Trade Name : Shenzhen NORCO Intelligent Technology Co.,Ltd.

Model Name : EMB-4922

Responsible Party : Shenzhen NORCO Intelligent Technology Co.,Ltd.


Equipment Classification : FCC Class B Subassembly

Type of Product : EMB-4922 Digital Signage Motherboard

Manufacturer : Shenzhen NORCO Intelligent Technology Co.,Ltd.

## **Supplementary Information:**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Signature:   
\_\_\_\_\_

Date: 2012

## Disclaimer

Except for the accessories attached to the product as specified herein, what is contained in this user manual does not represent the commitments of NORCO Company. NORCO Company reserves the right to revise this User Manual, without prior notice, and will not be held liable for any direct, indirect, intended or unintended losses and/or hidden dangers due to installation or improper operation.

Before ordering products, please learn about the product performance from the distributors to see if it is in line with your needs. NORCO is a registered trademark of Shenzhen NORCO Intelligent Technology CO.,LTD. The ownership of other trademarks involved in this manual is owned by its respective owners.

The contents of this manual are protected by copyright law. All rights are strictly reserved. Any form of unauthorized reproduction including but not limited to carbon copy, facsimile transmission and electronic copy or email is prohibited.

## Safety Instructions

1. Please read this manual carefully before using the product.
2. Put all the unused or uninstalled boards or electronic components in a static dissipative surface or static shielding bag.
3. Always ground yourself to remove any static discharge before touching the board, to place your hands on grounding metal object for a while or wear a grounding wrist strap at all times.
4. When taking or fetching the boards or cards, please wear antistatic gloves and have the habit of holding the cards by edges.
5. Make sure that your power supply is set to the correct voltage in your area. Incorrect voltage may cause personal injuries and damage the system.
6. To prevent electronic shock hazard or any damage to the product, please ensure that all power cables for the devices are unplugged when adding or removing devices or reconfiguring the system.
7. To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
8. When adding or removing devices to or from the system, ensure that all the power cables for the devices are unplugged in advance.
9. To prevent any unnecessary damage to the products due to frequent power on/off, please wait at least 30 seconds to restart the unit after the shutdown.
11. This product belongs to Class A, which may cause radio interference. In this situation, users need to take measures against the radio interference.

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## Packing List

Thanks for purchasing NORCO products. Please check the accessories as per the packing list when you open its package. If you find any defect components or anything damaged or lost, please contact your vendor ASAP.

- EMB-4922 1pcs
- Drivers and Utilities 1pcs
- Jumper Caps 1 bag
- Wire & Cables



# Chapter 1. Product Introduction

# Chapter 1 Product Introduction

## 1.1 Specification

### Dimension

- Dimension: 115mm x 165mm

### Processor

- CPU: Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5

### Chipset

- Chipset: HM76 Mobile

### System Memory

- System Memory: 1x single channel SO-DIMM slot supports DDR3 1066/1333/1600MHZ RAM up to 4GB. Non-ECC.

### Display

- Interfaces: LVDS, HDMI
- Display Combination: HDMI+HDMI, HDMI+LVDS
- LVDS: Dual channel 24Bit LVDS
- HDMI: maximum resolution: 1920x1200@60Hz

### Ethernet

- Network Controller: PCIe Chip: RTL8111E
- Transfer rate: 10/100/1000Mbps
- Support wake-on-LAN (WOL)

### Storage

- Support SATAI/SATAII/SATAIII;
- Provides 2x standard 7Pin SATA

### AUDIO

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## EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

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- Adopt ALC887 audio controller chip, dual channel, stereo
- Interface: two single-hole socket. Mic-in (pink), Speak-out (Green).

### I/O

- I/O Chip: W82627DHG
- COM: COM2: RS232/RS422/RS485

### USB

- 1x double layer USB3.0 socket

### KBMS

- One 2x 4Pin 2.0mm KBMS Pin, switch to standard PS/2 connector with an adapter cable.

### Expansions

- 1x standard mini PCIe supports WiFi module

### OPS Connector (reserve, default [Uninstalled])

- Standard OPS connector, including 1x HDMI, 1x Display Port, 1x COM, 2x USB2.0, 1x USB3.0, 1x PCIE X1 (If customers need these interfaces, NORCO can customize an adapter card to support these interfaces)

### Power Supply

- Square 2x2Pin single power supply
- Support 12V power input

### Watchdog

- Support system reset function

### BIOS

- BIOS: 8MB SPI FLASH, AMI EFI BIOS.

### Operating System

- Support WIN XP, WIN7, WIN8

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## EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

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- Support WIN XPE, WIN7E
- Support LINUX

### **Operating Environment**

- Operating Temperature: 0℃~60℃
- Operating Humidity: 5%~95%, non-condensing
- Storage temperature: -20~80℃



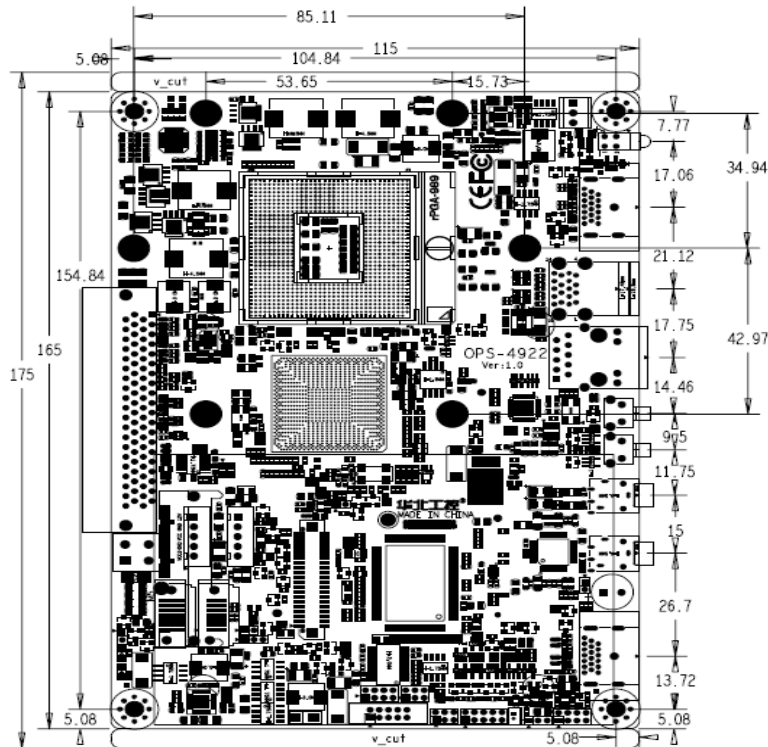
## Chapter 2. Motherboard Instructions

## Chapter 2 Motherboard Instructions

### 2.1 Interfaces Location & Dimension

Following picture illustrates the front interfaces location and the dimension of board EMB-4922. Please pay attention to the installation process. Improper installation of some components may lead to system failure.

**Note:** When installing the board, please wear anti-static gloves in case of any electrostatic damage caused during the installation.




### 2.2 Installation Steps

Please follow the steps below to assemble your computer:

1. Adjust all jumpers on board EMB-4922 as per the user manual.

2. Install Memory
3. Install other expansion cards
4. Connect all signal lines, cables, panel control circuit and power supply.
5. Start the computer, complete BIOS setup.

 **Key components of this motherboard are Integrated circuit and these components could be easily damaged by electrostatic influence. So, before installing this unit, please always keep the following precautions in mind:**

1. Hold the board by edges and don't touch any components or plug and socket pins.
2. Wear anti-static gloves/wrist strap while touching the integrated circuit components, such as CPU, RAM, etc.
3. Put those unused or uninstalled components in static shielding bags or trays.
4. Please first check the power switch is off before connecting the power plug.

### 2.3 Install Memory

EMB-4922 provides 1x single channel SO-DIMM slot supporting DRR3 1066/1333/1600MHz RAM up to 4GB. Please refer to the steps below:

1. First, please align the notch of the memory bank with the alignment mark on the socket and press the memory bank slowly into the socket.
2. Please choose the proper memory bank that matches your motherboard.

**Before installing your computer accessories, please make sure:**

1. Your computer is disconnected from power supply.
2. Wear anti-static gloves or wrist strap to touch the integrated circuit components ( such as RAM).

### 2.4 Jumper Settings

Please refer to following instructions to do jumper settings before installing the motherboard.

**Remark:** How to identify the PIN1 of all jumpers and interfaces: Please observe the word mark on the side of the plug socket, which will be a "1" or bold line or triangular symbol; And please look at the back of PCB, each with a square shape will be the PIN 1; and all the jumpers' PIN1 have a white arrow on the side.

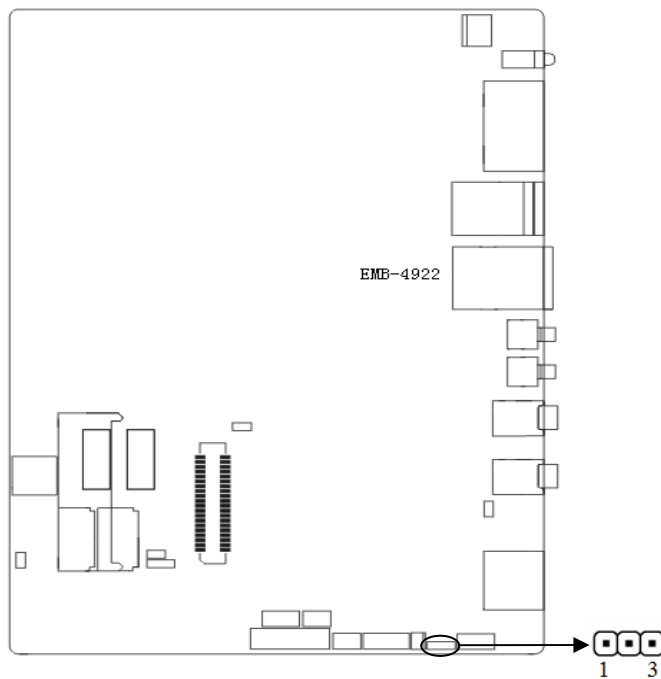


### 2.4.1 CMOS Clear/Hold Jumper Setting (JCC)

CMOS is powered by the onboard button cells. Clear CMOS may lead to permanent elimination of previous system settings and make the system back to the original settings (factory default).


Steps:

- (1) Shut off the computer and disconnect power supply
- (2) Make the jumper JCC Pin1 and Pin2 short for 5~10 seconds (Pin1-2) and then make it back to default setting with Pin2-3 connected.
- (3) Start the computer and press<Del> to enter BIOS setup, then reload optimal defaults
- (4) Save and Exit.

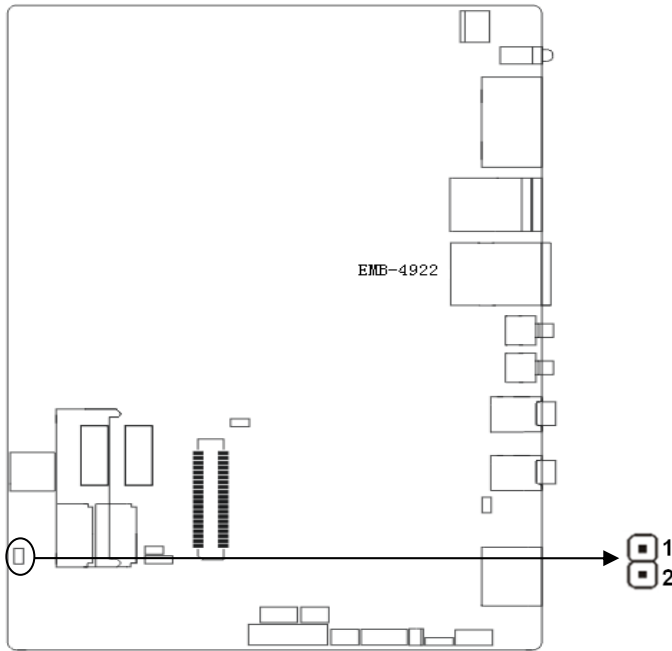


**JCC:**

Setting	JCC
1-2	Clear CMOS, BIOS back to Initialization(factory
2-3	Normal Status, default setting

 Do not clear CMOS when the computer is power on, otherwise, it may damage the motherboard!

### 2.4.2 Hardware Switch for System Auto Boot after Restore AC Power (JAT)

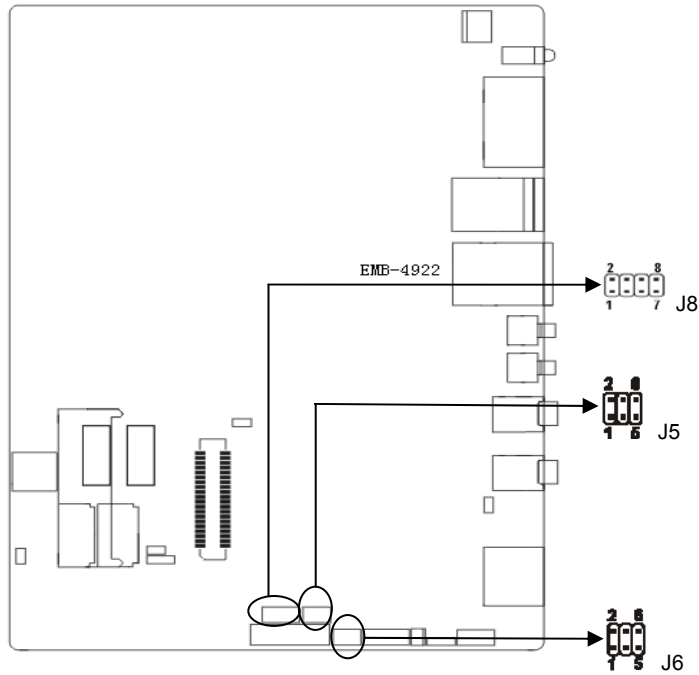


**JAT:**

Setting	JAT
Open	Non-auto boot upon power on
Close	Auto boot upon power on

### 2.4.3 COM2 Jumper Settings (J5, J6,J8)

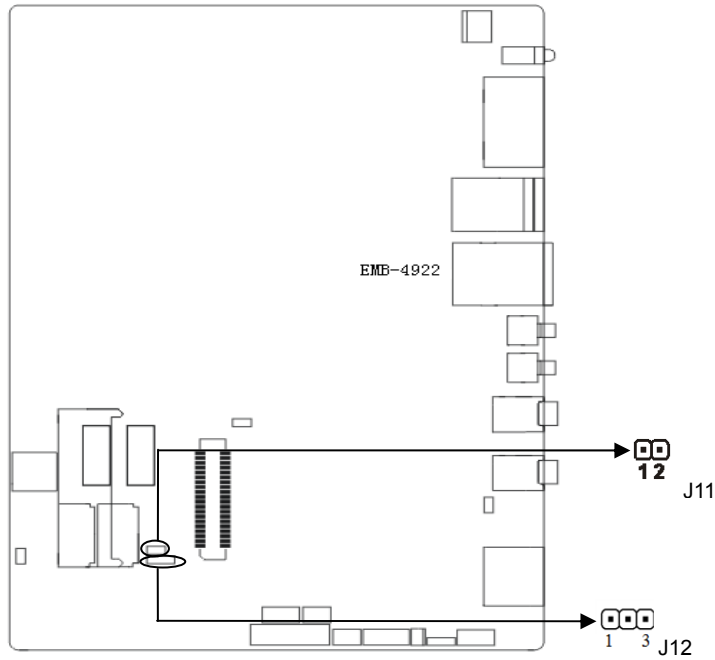
(J5, J6,J8) jumpers are used to configure COM2 transmission mode. COM2 supports RS232/RS422/RS485. Default setting: RS232.



COM2 AS RS232 PORT		COM2 AS RS422 PORT		COM2 AS RS485 PORT	
J5	1-3,2-4	J5	3-5,4-6	J5	-----
J6	1-3,2-4	J6	3-5,4-6	J6	3-5,4-6
J8	1-2	J8	3-4	J8	5-6 7-8

#### 2.4.4 LVDS Rated Voltage Select Jumper (J11, J12)

Before using LVDS, please first make clear of the LVDS rated voltage.



J11, J12:

Setting	3.3V	5V	12V
J11	×	×	1-2
J12	1-2	2-3	×

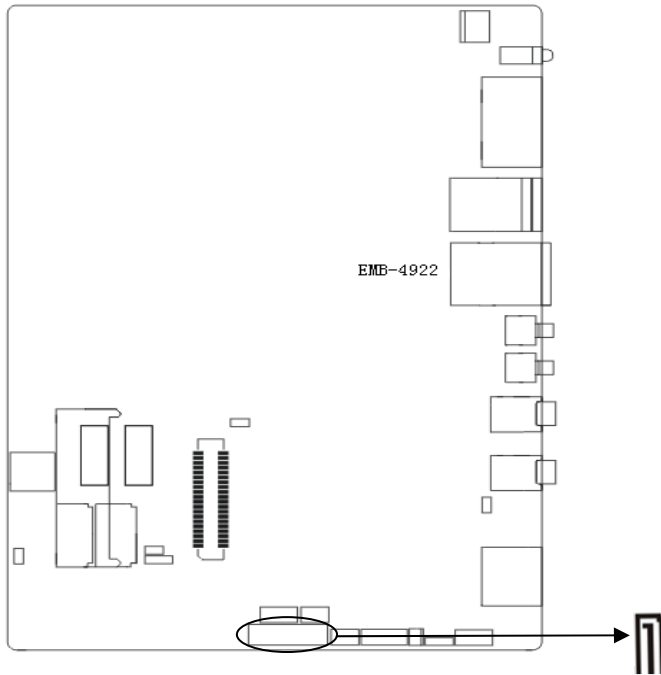
Note: J11& J12 cannot have the jump cap simultaneously.

## 2.5 Interfaces Description

**⚠** Please read the following instructions carefully before you connecting the external connectors in case of any damage caused to the motherboard!

### 2.5.1 Serial Port (COM2)

Board provides 1x serial port COM2. This port is a 2x5 2.0mm Pin, to be converted to standard DB9 COM with a serial adapter cable. COM2: RS232/RS422/RS485.



**COM2:**

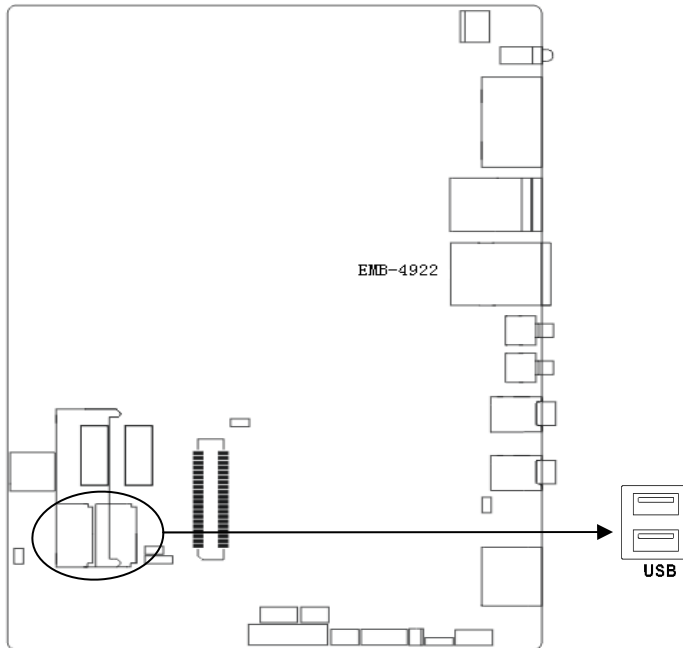
Signal Name	Pin		Signal Name
DCD	1	2	DSR
SIN	3	4	RTS
SOUT	5	6	CTS
DTR	7	8	RI
GND	9	10	GND

**COM2: RS485/RS422/ RS232 , Pins are defined as below:**

RS485	RS422	RS232	Pin		RS232	RS422	RS485
DATA-	TX-	DCD	1	2	DSR	NC	NC
DATA+	TX+	RXD	3	4	RTS	NC	NC
NC	RX+	TXD	5	6	CTS	NC	NC
NC	RX-	DTR	7	8	RI	NC	NC
GND	GND	GND	9	10	GND	GND	GND

### 2.5.2 SATA (SATA2, SATA3)

Board provides 2x standard 7Pin SATA ports.

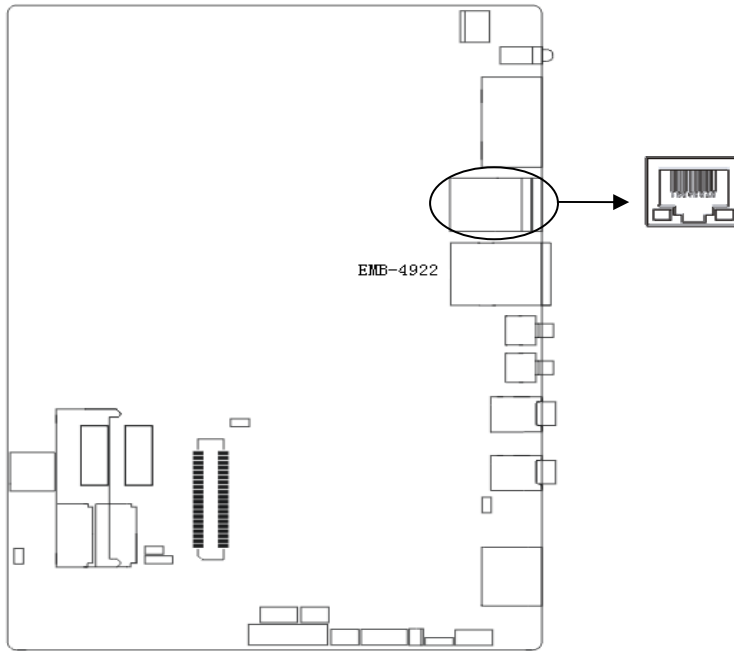


#### SATA2/SATA3:

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

### 2.5.3 USB (USB3.0)

Board provides one standard double layer USB3.0 socket.



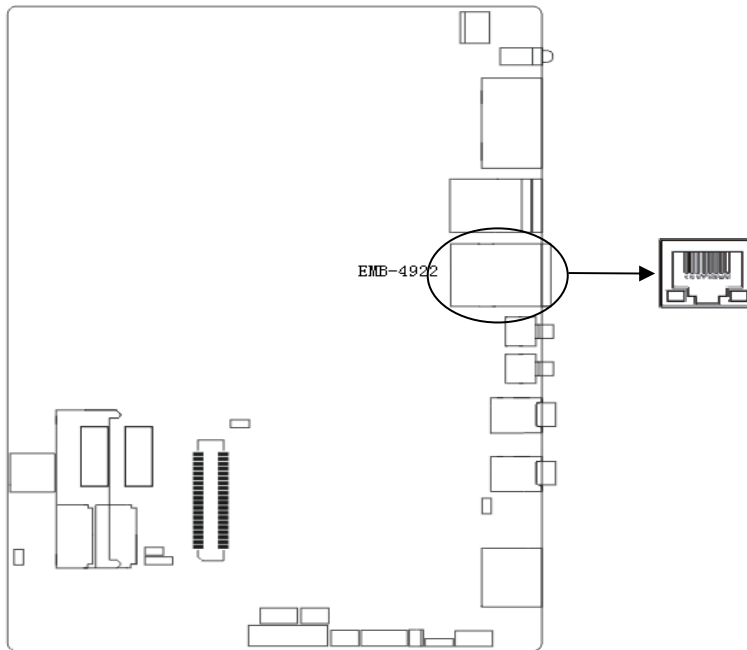
**USB30:**

Pin	Signal Name
1	VCC_USB1
2	USBD_N0
3	USBD_P0
4	GND
5	USB3_RX1_R_DN
6	USB3_RX1_R_DP
7	GND
8	USB3_TX1_R_DN
9	USB3_TX1_R_DP
10	VCC_USB1
11	USBD_N1
12	USBD_P1
13	GND
14	USB3_RX2_R_DN
15	USB3_RX2_R_DP

16	GND
17	USB3_TX2_R_DN
18	USB3_TX2_R_DP

**2.5.4 Ethernet (LAN)**

Board provides one RJ-45 Gigabit LAN port., Two LED lamps locates on the two sides of the RJ45 network interface. The yellow one indicates data transmission status. The green one indicates network link status



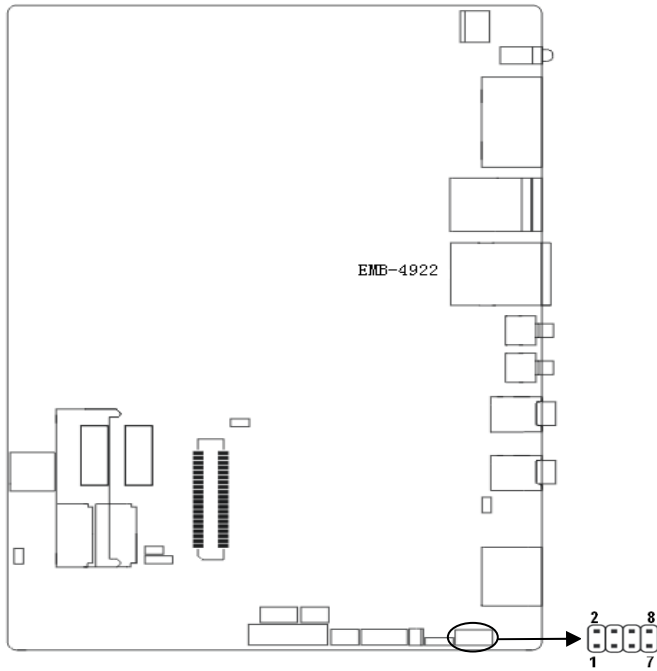
**RJ45 LAN LED Status:**

LILED (GREEN)	Function	ACTLED (YELLOW)	Function
On	100/1000M link	Flash	Data transfer
Off	10M link/close	Off	No data

**2.5.5 KB/MS (KBMS)**

Board provides one 2x 4Pin keyboard and mouse connector, which is converted to standard PS/2 to connect keyboard and mouse.



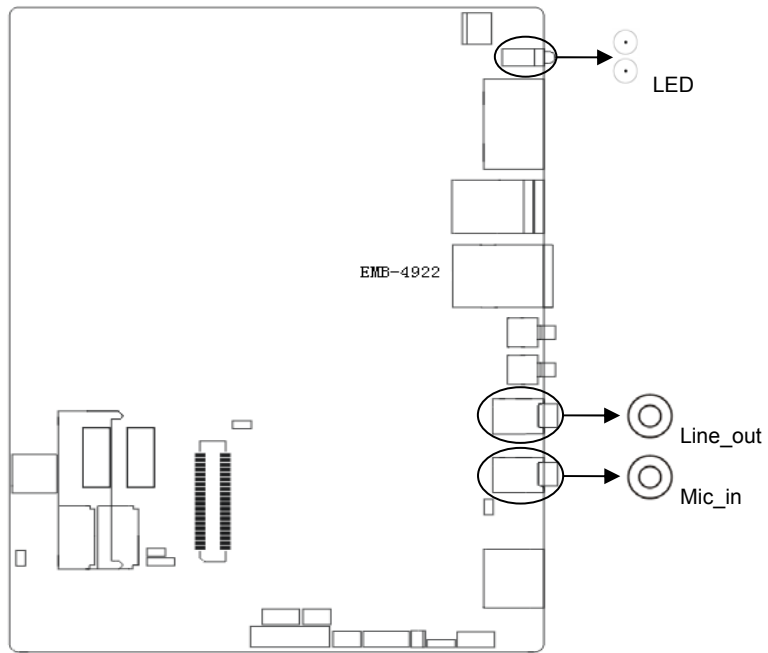


**KB/MS:**

Signal Name	Pin		Signal Name
VCC5	1	2	MS_CLK
GND	3	4	MS_DATA
KB_DATA	5	6	GND
KB_CLK	7	8	VCC5

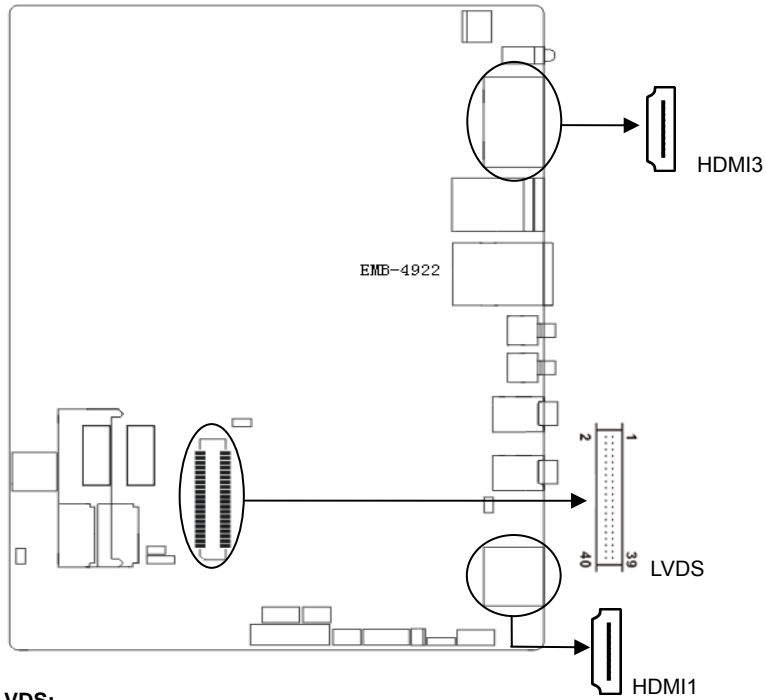
**2.5.6 Audio & Rear Panel LED (Speak-out, MIC-in, LED)**

EMB-4922 adopts ALC887 audio controller chip. The pink one is Mic-in; the green one is Speak-out.



### 2.5.7 Display Interface (LVDS, HDMI1, HDMI3)

Board provides one 2x20Pin LVDS.



**LVDS:**

Signal Name	Pin		Signal Name
VDD_PANEL	1	2	VDD_PANEL
GND	3	4	GND
LVDSA_DATA0#	5	6	LVDSB_DATA0#
LVDSA_DATA0	7	8	LVDSB_DATA0
GND	9	10	GND
LVDSA_DATA1#	11	12	LVDSB_DATA1#
LVDSA_DATA1	13	14	LVDSB_DATA1
GND	15	16	GND
LVDSA_DATA2#	17	18	LVDSB_DATA2#
LVDSA_DATA2	19	20	LVDSB_DATA2
GND	21	22	GND
LVDSA_CLK#	23	24	LVDSB_CLK#
LVDSA_CLK	25	26	LVDSB_CLK
GND	27	28	GND
LVDS_DD_V_DATA	29	30	LVDS_DDC_CLK

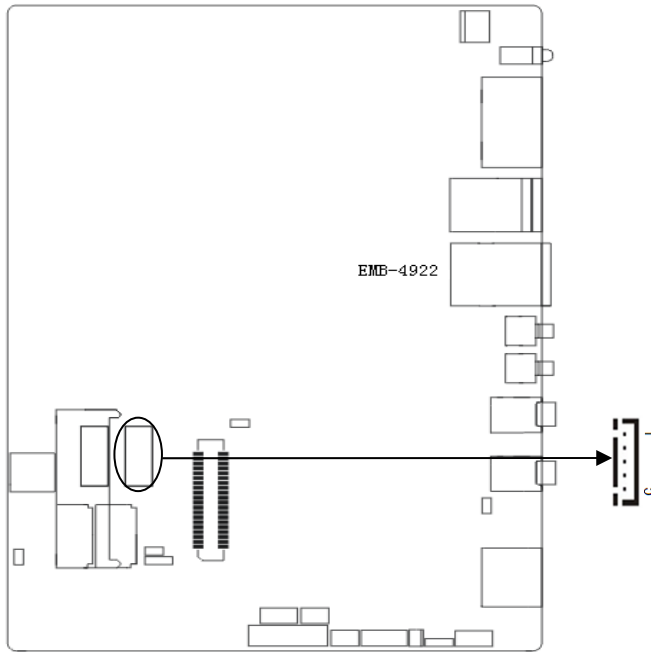
EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

GND	31	32	GND
LVDSA_DATA3#	33	34	LVDSB_DATA3#
LVDSA_DATA3	35	36	LVDSB_DATA3
VCC3	37	38	GND
NC	39	40	NC

**HDMI1, HDMI3:**

Signal Name	Pin		Signal Name
D2+	1	2	D2 Shield
D2-	3	4	D1+
D1 Shield	5	6	D1-
D0+	7	8	D0 Shield
D0-	9	10	CK+
CK Shield	11	12	CK-
CE Remote	13	14	NC
DDC CLK	15	16	DDC DATA
GND	17	18	+5V
HP DET	19	20	SHELL0
SHELL1	21	22	SHELL2
SHELL3	23	24	SHELL4
SHELL5	25	26	SHELL6
SHELL7	27	28	SHELL8
SHELL9	29	30	SHELL10
SHELL11	31		

**2.5.8 LVDS Power Voltage (LVDS\_BKLT)**

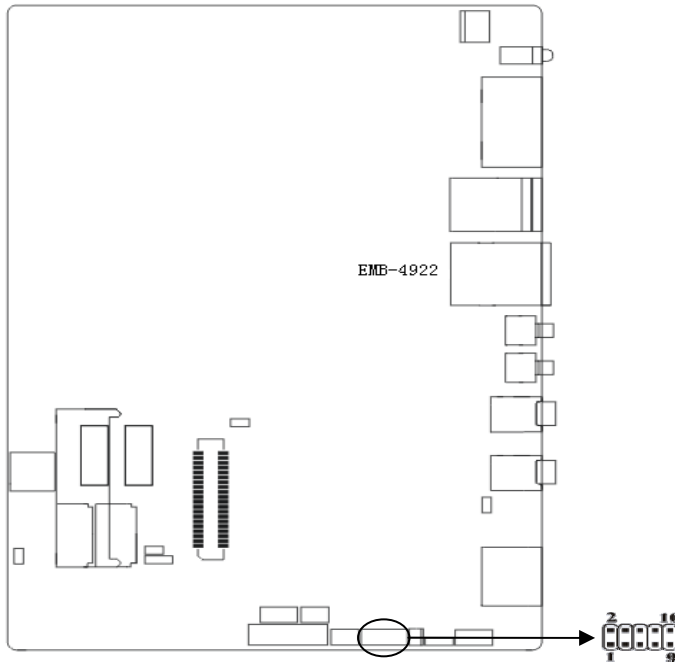


**LVDS\_BKLT:**

Pin	Signal Name
1	+12V_LVDS (12V)
2	BKLT_EN (ON/OFF)
3	GND
4	BKLT_CTRL (DIMM)
5	VCC_LVDS (5V)

**2.5.9 GPIO (GPIO)**

General Purpose Programmable Input/output.

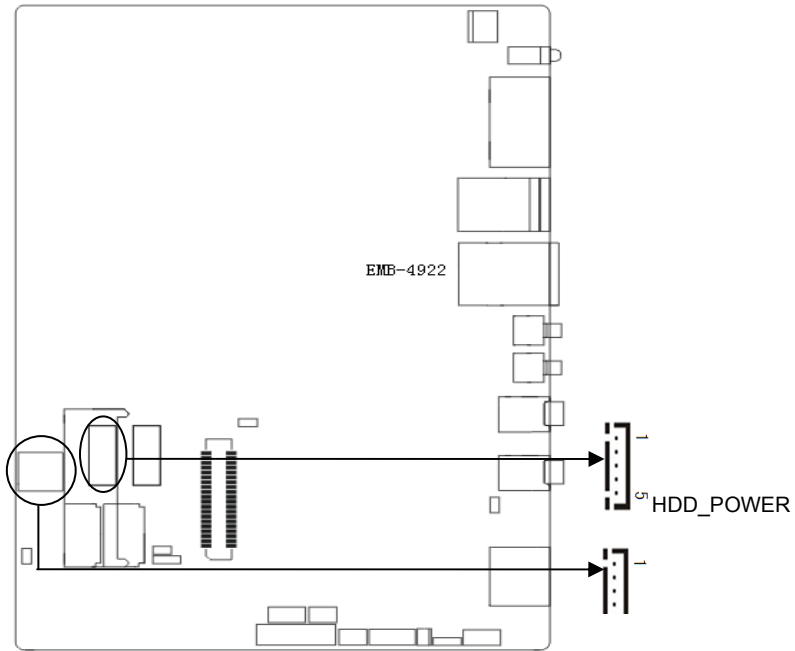


**GPIO:**

Signal Name	Pin		Signal Name
VCC	1	2	GPO20
GPI24	3	4	GPO21
GPI25	5	6	GPO22
GPI26	7	8	GPO23
GPI27	9	10	GND

**2.5.10 Power Interface (PWR,HDD\_POWER)**

Square 2X2pin single supply power interface; one 1x 5pin small white HDD\_PWR socket.



**PWR:**

Pin	Signal Name
1	GND
2	GND
3	+12V
4	+12V

**HDD\_POWER:**

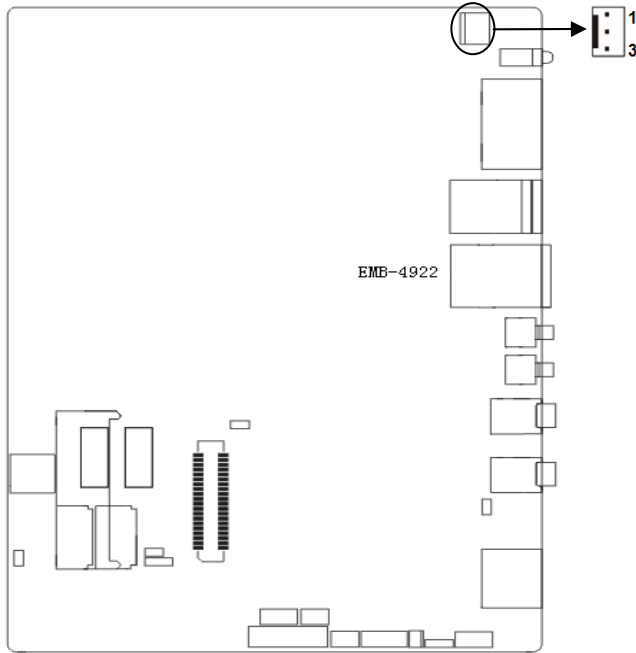
Pin	Signal Name
1	+12V
2	GND
3	VCC
4	GND
5	3.3V

**2.5.11 FAN Connector (CPUFAN)**

Board provides one 3Pin CPU FAN connector. Please pay attention to following two points:

## EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

- (1) The FAN Current  $\leq 500$  mA (6W, 12V)
- (2) Make sure the fan cable matches the wiring of the socket.

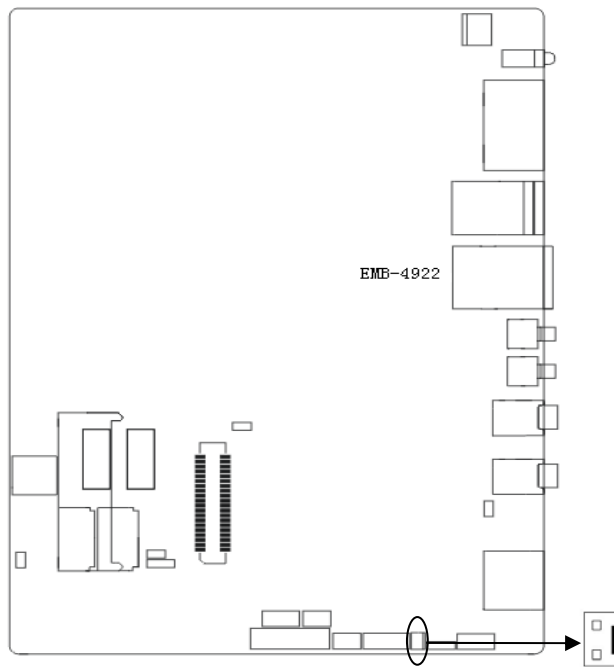


### CPUFAN:

Pin	Signal Name
1	GND
2	+12V
3	Speed detect



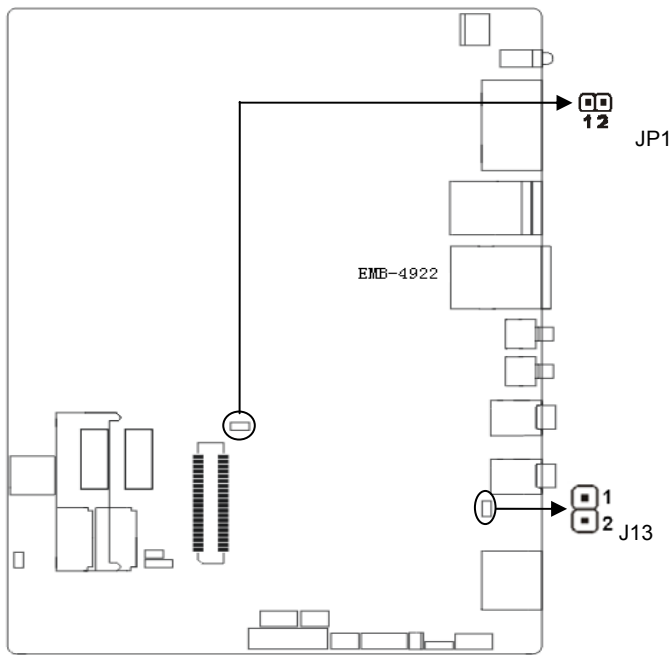
2.5.12 JBAT



**JBAT:**

Pin	Signal Name
1	BAT+
2	GND

**2.5.13 ( J13, JP1)**



**2.5.14 SO-DIMM Slot**

Board provides one single channel SO-DIMM slot supporting DDR3 1066/1333/1600MHZ RAM up to 4GB.

**2.5.15 MINI PCIe Port ( MINI PCIe )**

Board provides one MINI PCIe slot to expand any Mini PCIe devices (such as Wifi) as per actual needs.



## Chapter 3. BIOS SETUP

## Chapter 3 BIOS SETUP

### AMI BIOS Flash

BIOS functions as a bridge connecting hardware and operating system. Hardware and software are upgrading all the time, so when your system goes wrong, for example, your system can not support the newest CPU, you need to upgrade BIOS to keep up with the latest technology.

AFUEFI.EXE is the FLASH IC program for BIOS to upgrade, which needs to be run in DOS mode.

Please use a boot disk to load DOS, then run AFUDOS.EXE to upgrade BIOS ( for example: write XXXX.ROM into FLASH IC ) .

Specific Operation Instruction:

C:\AFUEFI \*\*\*\*.rom /P /B /N /X

If you need to add other parameters after the order format, please add <space>/?

#### Remark:

1. BIOS upgrading is only executed when it is necessary
2. Please use the BIOS SETUP programs in the CD-ROM provided by us or download the latest version on related websites
3. Please do not power off or reboot the system during BIOS upgrading, otherwise, the BIOS maybe be damaged or system may not be able to boot again.
4. After finishing BIOS upgrading, users need to load default manually to optimize
5. To prevent any unexpected problems, please backup your BIOS in advance.

### AMI BIOS Description

When the computer is power on, BIOS will conduct self-diagnosis to its hardware on motherboard and configure hardware parameter; finally the operating system will take control. BIOS is the communication bridge between hardware and O/S. Correct configuration of BIOS. is critical for maintaining system stability and its optimized performance.

### BIOS Settings

1. Power on the computer and system will conduct self-detection.
2. When message "Press <<Del>> to enter SETUP, <F11> to Popup Menu" pops up on the screen, please press Del to enter BIOS setup.

## EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

3. Use the “← ↑ → ↓” to select the option which you want to modify, press <Enter> to go to the sub-menu.
4. Use the “← ↑ → ↓” and <Enter> to modify the value; press “Enter” to modify BIOS options that you choose.
5. At any time, press <Esc> can go back to the father-menu.

### 3.1 Main Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
BIOS Information		Set the Date. Use Tab to switch
BIOS Vendor	American Megatrends	Between Date elements.
BIOS Version	4922T101	
Build Date and Time	02/27/2013 14:52:53	
CPU Information		
Intel(R) Core(TM) i5-3610ME CPU @ 2.70GHZ		
Memory Information		
Total Memory	2048 MB (DDR3)	→←: Select Screen
Memory Frequency	1333 MHZ	↑↓: Select Item
		Enter: Select
Intel SB Name	HM76	+/-: Change Opt.
Stepping	04/C1	F1: General Help
		F2: Previous Values
ME FW Version	8.1.20.1336	F9: Optimized Defaults
ME Firmware SKU	1.5MB	F10: Save&Exit
		ESC: Exit
System Date	[Wed 02/22/2012]	
System Time	[15:50:03]	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

#### BIOS Vendor

BIOS vendor: American Megatrends

**Project Version**

BIOS version: 7937T102

**Build Date and Time**

BIOS date and time: 10/23/2012 11:28:31.

**System Date**

System Date Format: Month (Jan.-Dec.) / Date (01-31)/ Year ( up to 2099) / Week (Mon.~Sun.).

**System Time**

System Time Format: Hour (00-23) / Minute (00-59) / Second (00-59).

**3.2 Advanced**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends,Inc	
Legacy OpROM Support Launch LAN1 PXE OpROM [Disabled]	Enable or Disable Boot Option for Legacy Network Devices.
<ul style="list-style-type: none"><li>▶ ACPI Setting</li><li>▶ APM Configuration</li><li>▶ CPU Configuration</li><li>▶ SATA Configuration</li><li>▶ Intel(R) Rapid Start Technology</li><li>▶ USB Configuration</li><li>▶ Super IO Configuration</li><li>▶ H/W Monitor</li><li>▶ Serial Port Console Redirection</li><li>▶ CPU PPM Configuration</li></ul>	<ul style="list-style-type: none"><li>→←: Select Screen</li><li>↑↓: Select Item</li><li>Enter: Select</li><li>+/-: Change Opt.</li><li>F1: General Help</li><li>F2: Previous Values</li><li>F9: Optimized Defaults</li><li>F10: Save&amp;Exit</li><li>ESC: Exit</li></ul>
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

**Launch LAN1 PXE OpROM**

Enable or Disable Boot Option for Legacy Network Devices.

### 3.2.1 ACPI Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
ACPI Settings	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
ACPI Sleep State [S1 only (CPU Stop C1...)]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

#### ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S1 (POS): CPU stops working while other devices are still connected to power supply.

S3 (STR): Power is only supplied to system memory.

**3.2.2 APM Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
RTC Power On Function	[Disabled]	Enable or Disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**RTC Power On Function**

Enable or disable the RTC Power On Function.

**RTC Power On Hour**

Setup RTC Power On Hour.

**RTC Power On Minute**

Setup RTC Power On Minute.

**RTC Power On Second**

Setup RTC Power On Second.



**3.2.3 CPU Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
CPU Configuration		Enable or for Windows XP and Linux (OS Optimized for Hyper Threading Technology) and Disabled for other OS (OS not Optimized for Hyper Threading Technology). When Disabled only one thread per enabled core is enabled.
Intel(R) Core(TM) i5-3610ME CPU @ 2.70GHZ		
CPU Signature	306a8	
Microcode Patch	10	
Max CPU Speed	2700MHZ	
Min CPU Speed	1200MHZ	
CPU Speed	2700MHZ	
Processor cores	2	→←: Select Screen
Intel HT Technology	Supported	↑↓: Select Item
Intel VT-X Technology	Supported	Enter: Select
Intel SMX Technology	Supported	+/-: Change Opt.
64-bit	Supported	F1: General Help
L1 Data Cache	32KB*2	F2: Previous Values
L1 Code Cache	32KB*2	F9: Optimized Defaults
L2 Cache	256KB*2	F10: Save&Exit
L3 Cache	3072KB	ESC: Exit
Hyper-threading	[Enabled]	
Active Processor Cores	[All]	
Limit CPUID Maximum	[Disabled]	
Execute Disable Bit	[Enabled]	
Intel Virtualization Technology	[Disabled]	
Hardware Prefetcher	[Enabled]	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

The read only options contain the detailed information of CPU, including CPU supplier, model, frequency, Level1 Cache, Level2 Cache, etc.

**Hyper-Threading**

Enable or disable CPU Hyper-Threading Technology.

### **Active Processor Cores**

Activate Processor Cores (only when the processor has multiple cores).

### **Limit CPUID Maximum**

Please set this item as [Enabled] if the system OS doesn't support the extended CPUID function.

### **Execute Disabled Bit**

Execute Disable Bit (EDB) is a hardware-based security feature that introduced to its new generation CPU by Intel, which can help reduce system exposure to viruses and malicious code. EDB allows the processor to classify areas in memory where application code can or cannot execute. To use Execute Disable Bit you must have Windows XP SP2 operating system to support this function. System default this option [Enabled].

### **Intel Virtualization Technology**

Intel virtualization technology enables to run multiple O/S of the same kind or different kind by using the same physical platform so as to realize the management and allocation of computer resources, maximizing the resource utilization.

### **EIST**

Enable or disable the Enhanced Intel SpeedStep Technology (EIST). Enhanced Intel SpeedStep Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

### **CPU C state Report**

To enable or disable the CPU C state report function. C-States is the CPU C-states power saving modes. They are numbered starting at C0, which is the normal CPU operating mode, i.e., the CPU is 100% turned on. The higher the C number is, deeper is the CPU sleep mode.

**3.2.4 SATA Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
SATA Configuration(S)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[IDE]	
Serial ATA Port1	Empty	→←: Select Screen
Serial ATA Port2	Empty	↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**Serial-ATA Controller(S)**

Enable or disable Serial-ATA controller. Configure SATA as [Disabled], [Enhanced] or [Compatible].

**SATA Mode**

Configure SATA mode.

**3.2.5 Intel(R) Rapid Start Technology**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Intel(R) Rapid Start Technology [Disabled]	
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

**3.2.6 USB Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
USB Configuration		Enables Legacy USB support. AUTO option disables legacy Support if no usb devices are connected.
USB Devices:		
1 Drive, 1Keyboard,1 Mouse, 2 Hubs		
Legacy USB Support	[Enabled]	
EHCI1	[Enabled]	
EHCI2	[Enabled]	
XHCI	[Enabled]	
XHCI Hand-off	[Enabled]	
EHCI Hand-off	[Disabled]	
USB Mass Storage Driver Support	[Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
USB hardware delays and time-outs:		
USB transfer time-out	[20 sec]	
Device reset time-out	[20 sec]	
Device power-up delay	[Auto]	
Mass storage Devices:		
KingstonDT 101 G2 PMAP	[Auto]	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**USB 2.0 (EHCI) Support**

[Enabled]: Enable USB EHCI transmission protocols, transfer rate up to 480Mbps;

[Disabled]: Disable USB2.0 port, traditional transfer rate is12Mbps.

**XHCI (USB3.0 controller)**

[Enabled]: open USB3.0 controller; [Disabled]: Close USB3.0 controller.

**Legacy USB Support**

Enable Legacy USB support. Set this option [Enabled] or [Auto] if you want system to support

USB devices, such as U disk, USB keyboard, etc. in DOS. Otherwise, select this option as [Disabled]. [Auto] option disables legacy support if no USB devices are connected.

**Mass Storage Devices**

Select the types of the connected USB Mass Storage devices. [Auto], [floppy], [Forced FDD], [HDD] or CD-ROM. System defaults as [Auto].

**3.2.7 Supper IO Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Super IO Configuration ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration ▶ Watch Dog Configuration	Set Parameters of Serial Port 1 (COM1)
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

**Serial Port 1 Configuration**

**1) Serial Port**

Enable or disable serial port.

**2) Device Setting (Read Only)**

Serial port IRQ & base address.

3) Change Setting

Change serial port settings. Default setting: [Auto].

Aptio Setup Utility - Copyright (C) 2012 American Megatrends,Inc	
Serial Port 1 Configuration	Enable or Disable serial port (COM)
Serial Port [Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Device settings IO=3F8H;IRQ=4	
Change settings [Auto]	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

Serial Port 2 Configuration follows the same instructions as above.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends,Inc	
Watch Dog Configuration	Enable or Disable Watch Dog Function
Watch Dog Function [Disabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit

Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.

**3.2.8 H/W Monitor**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
PC Health Status		
SYSTIN temperature	:+40C	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
CPUTIN temperature	:+56C	
CPU Fan Speed	:+4963 RPM	
CPUVCORE	:+1.184 V	
+3.3VIN	:+3.243 V	
+1.5VIN	:+1.520 V	
+5VIN	:+4.975 V	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**PC Health Status**

PC Health Status Detect. BIOS will display current system temperature, CPU temperature, FAN rotate speed, and related voltage value.

**Smart Fan Function**

Enable or disable the smart fan function (the intelligent fan speed control function).



Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
COM1 Console Redirection [Disabled] ▶ Console Redirection Settings	Console Redirection Enable or Disable. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
COM2 Console Redirection [Disabled] ▶ Console Redirection Settings	
Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection [Disabled] ▶ Console Redirection Settings	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

**Console Redirection**

Enable or disable COM console redirection function. This function works only in DOS during system startup.

**Windows Emergency Management Services**

The Emergency Management Services (EMS), available in Windows Server 2003 and Windows Server 2008, provides "headless" support for today enterprise servers. It enables management services without the need for a keyboard, mouse, local monitor, and video adapter. A server administrator interacts with EMS through a Special Administration Console (SAC) to perform management and recovery tasks, even when the system's operational status is questionable. There is no need to enable EMS redirection when enabling serial port console redirection.

Enable or disable COM console redirection function in system.

3.2.9 Serial Port Console Redirection

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.	
COM5 Console Redirection [Disabled] ▶ Console Redirection Settings	Console Redirection Enable or Disable.
COM6 Console Redirection [Disabled] ▶ Console Redirection Settings	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection [Disabled] ▶ Console Redirection Settings	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

Double click "Console Redirection [Disabled]", following options will pop out:

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
COM5		Emulation:ANSI:Extended ASCII
Console Redirection Settings		Chat set.VT100:ASCII char set .
Terminal Type	[VT100+]	VT100+:Extends VT100 to support
Bits per second	[115200]	Color,function
Data Bits	[8]	keys,etc.VT-UTF8 : Uses
Parity	[None]	UTF8.encoding to map
Stop Bits	[1]	Unicode chars onto 1 or more
Flow Control	[None]]	→←: Select Screen
VT-UTF8 Combo Key Sup	[Enabled]	↑ ↓ : Select Item
Recorder Mode	[Disabled]	Enter: Select
Resolution 100*31	[Disabled]	+/-: Change Opt.
Legacy OS Redirection	[80*24]	F1: General Help
Putty KeyPad	[VT100]	F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

Double click "Windows Emergency Management Services (EMS)" following options will pop out:

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Out-of-Band Mgmt Port	[COM5]	Microsoft Windows Emergency
Terminal Type	[VT100+]	Management Services (EMS)
Bits per second	[None]	Allows for remote management of
Data Bits	8	A Windows Server OS through a
Parity	None	Serial port.
Stop Bits	1	→←: Select Screen
		↑ ↓ : Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**Console Redirection**

Enable or disable COM Console Redirection.

**3.2.10 CPU PPM Configuration**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
CPU PPM Configuration		Enable/Disable Intel Speed Step
EIST	[Enabled]	

## EMB-4922 Ivy Bridge Gen3 /Sandy Bridge Gen2 i3/i5 Motherboard

Turbo Mode	[Enabled]	→←: Select Screen
CPU C3 Report	[Enabled]	↑ ↓ : Select Item
CPU C6 Report	[Enabled]	Enter: Select
CPU C7 Report	[Enabled]	+/-: Change Opt.
Config TDP LOCK	[Disabled]	F1: General Help
Long duration power l	0	F2: Previous Values
Long duration maintai	0	F9: Optimized Defaults
Short duration power	0	F10: Save&Exit
ACPI T State	[Disabled]	ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

### EIST

Enable or disable the Enhanced Intel SpeedStep Technology (EIST). Enhanced Intel SpeedStep Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

### CPU C state Report

To enable or disable the CPU C state report function. C-States is the CPU C-states power saving modes. They are numbered starting at C0, which is the normal CPU operating mode, i.e., the CPU is 100% turned on. The higher the C number is, deeper is the CPU sleep mode.

## 3.3 Chipset Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
▶ North Bridge	North Bridge Parameters
▶ South Bridge	

	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

### 3.3.1 North Bridge

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc			
VT-d Capability	Supported	Check to enable VT-d function on MCH.	
VT-D	[Enabled]		
DVMT Pre-Allocated	[64M]	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit	
DVMT Total Gfx Mem	[MAX]		
Primary IGFX Boot Display	[VBIOS Default]		
Secondary IGFX Boot Display	[Disabled]		
Active LFP	[Int-LVDS]		
LCD Panel Type	[1280*1024 LVDS]		
Panel Color Depth	[24 Bit]		
Flat Panel Backlight	255		
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.			

#### Primary Display

Select internal graphics or external graphics as the primary display.

**DVMT Pre-Allocated**

Internal graphics pre-allocated DVMT.

**DVMT Total Gfx Mem**

Internal graphics shared video memory.

**Primary IGFX Boot Display**

Select onboard primary IGFX Boot Display (such as VGA, HDMI, DVI, and LVDS).

**Secondary IGFX Boot Display**

Select onboard secondary IGFX Boot Display (such as VGA, HDMI, DVI, and LVDS).

**Active LFP**

Enable or disable LVDS display.

**LCD Panel Type**

Set LCD Panel resolution in LVDS display mode.

**Panel Color Depth**

Set LVDS panel color depth.

**Flat Panel Backlight**

Set and adjust LVDS backlight and brightness.

**3.3.2 South Bridge**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Audio Controller	[Enabled]	Enabled/Disabled Audio controller.

LAN 1 Controller	[Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Wake on LAN	[Enabled]	
Restore AC Power Loss	[Power On]	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**Audio Controller**

Enable or disable the onboard audio controller.

**LAN1 Controller**

Enable or disable the onboard LAN1 Controller.

**Wake on LAN**

Enable or disable Wake-on-LAN function.

**Restore AC Power Loss**

This option is to setup the system status while connecting the power again after the AC Power Loss

<Power Off>: System remains the status of power off. Users need to press the power button to start the computer.

<Power On>: System will reboot automatically when connecting to power supply.

<Last State>: Remain the same state as that before the power loss.

**3.4 Boot Menu**

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Boot Configuration	Number of seconds to wait for
Setup Prompt Timeout      1	setup activation key.



Bootup Numlock State	[On]	65535(0xFFFF) means indefinite waiting.
Show Full Logo	[Enabled]	
Boot Option Priorities		→←: Select Screen
Boot Option #1	[UEFI:Built-in EFI...]	↑↓: Select Item
Boot Option #2	[SATA PM:SAMSUNG...]	Enter: Select
Boot Option #3	[UEFI:KingstonData...]	+/-: Change Opt.
Hard Drive BBS Priorities		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.		

**Setup Prompt Timeout**

Number of seconds to wait for setup shortcut key. 60s is the max seconds of timeout. If don't press Setup key within the preset time, system will continue to start.

**Bootup Numlock State**

This function allows users to activate Numlock function when boot up.

[ON]: Numlock is activated when system boots up

[OFF]: Numlock under cursor control.

**Show Full Logo**

[Enabled]: Computer boot screen will show supplier's LOGO.

[Disabled]: Self-detect info will show when system boots.

**Boot Option Priorities**

System will detect devices according to the preset sequence until to find a boot device. Option #1 is the prior boot device.

**Hard Drive BBS Priorities**

This option contains HDD that can be used as boot device. If multiple HDDs in this option, priority should set for these HDDs, then the prior one will show in Boot Option #1.

### 3.5 Security Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
The password length must be in the following range:	Set Administrator Password
Minimum length            1	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Maximum length            20	
Administration Password	
User Password	
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

The password length: Min: 1 character, Maximum: 20 characters.

#### Administrator Password

Set administrator password.

#### User Password

To setup User's Password. If you have set the password, system will display "Installed"; If not, system will display "Not Installed".

### 3.6 Save & Exit Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Load Defaults	Restore/Load Default values
Save Changes and Exit	for all the setup options

Discard Changes and Exit	→←: Select Screen
Boot Override	↑↓: Select Item
UEFI:KingstonDataTraveler G3 1.00	Enter: Select
SATA PM:SAMSUNG HM160HT	+/-: Change Opt.
UEFI:Built-in EFI shell	F1: General Help
	F2: Previous Values
	F9: Optimized Defaults
	F10: Save&Exit
	ESC: Exit
Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.	

**Load Defaults**

Restore/Load Default values for all BIOS setup options.

**Save Changes and Exit**

Press [Enter] to select this option and press [Enter] to confirm to save all BIOS changes and exit.

**Discard Changes and Exit**

Press [Enter] to select this option and press [Enter] to confirm to discard all changes and exit.



## Appendix

## Appendix

### Appendix 1: Watchdog Programming Guide

---

#### watchdog reference code (C)

---

Write and set the port in C language to realize various functions of the Watchdog Timer.

Port Instructions:

```
void main()
{
int indexp = 0x2e,datap = 0x2f;
unsigned char temp;
Outportb(indexp,0x87);
Outportb(indexp,0x87); //unlock
Outportb(indexp,0x2d);
temp = (unsigned char) inportb (datap);
temp &= 0xfe;
Outportb(indexp,0x2d);
Outportb(datap,temp); //set pin for watchdog
Outportb(indexp,0x07);
Outportb(datap,0x08);
Outportb(indexp,0x30);
Outportb(datap,0x01); //enable logical device
Outportb(indexp,0xf5);
Outportb(datap,0x00); //set second
Outportb(indexp,0xf6);
Outportb(datap,0x05); //set 5seconds
Outportb(indexp,0xf7);
Outportb(datap,0x00);
Outportb(indexp,0xaa); //lock
}
```

If system crashes, the Watchdog function enables system to auto reboot.

## Appendix 2: Glossary

---

### **ACPI**

Advanced Configuration and Power Management. ACPI specifications allow O/S to control most power of the computer and its add-ons

### **BIOS**

Basic input/output system. It is a kind of software including all in/out control code interface in PC. It will do hardware testing while system is booting, and then the O/S runs. BIOS provides a interface between O/S and hardware and is stored in a ROM chip.

### **BUS**

In a computer system, it is the channel among different parts for exchanging data; it is also a set of hardware lines. BUS here refers to part lines inside CPU and the main components of system memory.

### **Chipset**

Chipset is a Integrated set of chips for executing one or more related functions. Here it refers to a system level chipset structured by Southbridge & Northbridge; It decides the structure and main functions of motherboard.

### **CMOS**

Complementary Metal-Oxide Semiconductor, which is a widely used semiconductor with the characteristics of high-speed and low-power. COMS here refers to part of space on-board CMOS RAM for saving date, time, system information and system parameter, ect.

### **COM**

Computer-Output Microfilmer. A universal serial communication interface, usually adopts normative OB 9 connector.

### **DIMM**

Dual-Inline-Memory-Modules. It is a small circuit board with memory chipset providing 64 bit

memory bus width.

### **DRAM**

Dynamic Random Access Memorizer. It is a normal type of memory often with a transistor and a capacitance to store 1 bit. With the development of the technology, more and more types of DRAM with different specifications exist in computer applications. For example: SDRAM/DDR SDRAM/RDRAM.

### **LAN**

Network interface. Network grouped by correlative computers in a small area, generally in a company or a building. Local area network is buildup by sever, workstation, some communications links. Terminals can access data and devices anywhere through cables, which enables users to share costly devices and resource.

### **LED**

Light-Emitting Diode. A semiconductor device that shines when power supply is connected, It is often used to denote information directly, for example, to denote power on or HDD working normally.

### **PnP**

Plug-and-Play. It is a specification that allows PC to configure its external devices automatically and can work independently without the manual operation by its user . To achieve this function, its BIOS should be able to support PnP and a PnP expansion card.

### **POST**

Self-test when power on. While the system is booting, BIOS will do an uninterrupted testing to the system, including RAM, keyboard, hard disk drive etc. to check if all the components are in normal situation and work well.

### **PS/2**

A keyboard & mouse connective interface specification developed by IBM.PS/2 is a DIN interface with only 6PIN; it also can connect other devices, like modem.

### **USB**

It is the Universal Serial Bus for short. A hardware interface adapts to low speed peripherals, and is always used to connect keyboard, mouse etc. One PC can connect maximum 127 USB devices, providing 12Mbit/s transmit bandwidth USB supports hot swap and multi- data stream, namely, you can plug USB devices while system is running, system can auto-detect and makes it work on.

### Appendix 3: Install Driver

---

---

Please install the driver as per the following steps:

Insert the programmed disk into CD-ROM, so installation of the driver can be made either automatically or manually. Now manually installation instructions are given as below:

- 1) A variety of options are available regarding manually installation, which you can check from Device Manager.
- 2) Right click "my computer ", select "management", and go to "Device Manager"
- 3) Right click "display controller" in the menu of graphic card, select "Properties ", click "Driver", select "update driver".
- 4) Select "Show the list of all drivers which are designated locations so that choices can be made from it ", select "next."
- 5) Select the location of display driver, click "ok"
- 6) Complete the installation, restart the system.

Proceed with the installation of other drivers after restarting the system, till all installations are completed. Then user can check from the device manager that it says device is working.





敬请参阅

<http://www.norco.com.cn>

本手册所提供信息可不经事先通知进行变更

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