FSB-H81H

Intel® Core™ i7/i5/i3

LGA 1150 Processor

Full-size CPU Card

With DDR3/L, 2 Gigabit Ethernet

USB 3.0/ USB2.0

SATA 6.0Gb/s, SATA 3.0 Gb/s

FSB-H81H Manual Rev.A 1st Ed.
August 15, 2014

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 Cable Set
  - 1 Serial Port Cable with one DB-9 connector
  - 2 Serial Port Cable with two DB-9 connectors
  - 1 Cable with serial port (DB-9) and LPT(DB-25) port
  - 1 USB Cable with two USB 2.0 connectors
  - 4 SATA Cables
- 1 DVD-ROM for manual (in PDF format) and Drivers
- 1 FSB-H81H

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

General Information

1.1 Introduction

AAEON, a leading Industrial PC manufacturer, announces the debut of a high performance full-size Single Board Computer, the FSB-H81H. AAEON has developed this full-size SBC based on the latest Intel® H81 chipset and the Intel® 4th generation Core™ i7/i5/i3 LGA 1150 processor, to fulfill the increasing demands of multi-core processing.

In a PICMG 1.3 SHB Express form factor the FSB-H81H system host board takes full advantage of the Intel® H81 chipset for enhanced system performance and generous expansion capabilities. Two DIMM slots of dual-channel DDR3/DDR3L 1333/1600 sockets provide ample memory bus bandwidth for demanding applications. Moreover, this model equips six COM (four RS-232, and two RS-232/422/485), two USB3.0, and six USB2.0. In addition to the features above, the FSB-H81H deploys two SATA 6.0Gb/s and two SATA 3.0Gb/s. The FSB-H81H has been designed for users that require high performance and reliability for critical applications.

1.2 Features

- Intel® 4th Generation Core™ i7/i5/i3 LGA 1150 Processor
- Intel® H81 Chipset
- Dual-Channel DDR3/DDR3L 1333/1600 DIMM Socket x 2 (Up to 16 GB)
- Intel® H81 Integrated Intel® HD Graphics
- Gigabit Ethernet x 2
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2
- COM x 6 (RS-232 x 4, RS-232/422/485 x 2)
- USB3.0 x 2 (On bracket), USB2.0 x 6
- PICMG 1.3
- ATX 2.1 Power Requirement

Note: When FSB-H81H is accompanied external Gigabit Ethernet card through PCIe slots on backplane, the Ethernet works smoothly. However, when both Gigabit Ethernet ports are used simultaneously, the Ethernet performance may be decreasing.

1.3 Specification

System

Form Factor	PICMG 1.3 Full size SBC
Processor	Intel® 4th Generation Core™ i7/i5/i3 LGA 1150 Processor
System Memory	240-pin Dual-Channel DDR3/DDR3L 1333/1600 DIMM socket x 2, up to 16GB
Chipset	Intel® H81
Ethernet	Realtek 8111E 10/100/1000Base-TX x 2, RJ-45 x 2 on bracket
BIOS	AMI Plug & Play SPI BIOS-128MB ROM
Wake on LAN	Yes
H/W Status Monitoring	System temperature, voltage and cooling fan status monitoring
Expansion Interface	Follow PICMG 1.3 Regulation
Battery	Lithium battery
Power Requirement	ATX 2.1
Board Size	13.3” x 5” (339mm x 126mm)
Gross Weight	1.2 lb (0.5 Kg)
Operating Temperature	32°F ~ 140 °F (0°C ~ 60 °C)
Storage Temperature	-4°F ~ 158 °F (-20°C ~ 70 °C)
Operating Humidity	5%~90% resistive humidity, non-condensing

- MTBF (Hours) 60,000

Display

- Chipset Intel® H81
- Graphic Engine Integrated Intel® HD Graphics
- Resolution Up to 2048x1536 @ 75Hz for CRT
- Output Interface VGA x 1 or DVI x 1 on bracket

I/O: Fintek 81866D

- Storage SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2
- Serial Port COM x 6
  COM1~2: RS-232/422/485 on bracket
  COM3~6: RS-232, with box header
- PS/2 Port 4x2 pin header x 1
- USB USB3.0 x 2 (Type A on bracket)
  USB2.0 x 6 (two on pin header, four are on backplane)
- Parallel Port LPT port x 1
- Audio HDAC daughter board (optional) Mic-in/ Line-in/ Line-out/ CD-in
- Digital I/O 8-bit programmable (4-in/ 4-out)

Chapter

2

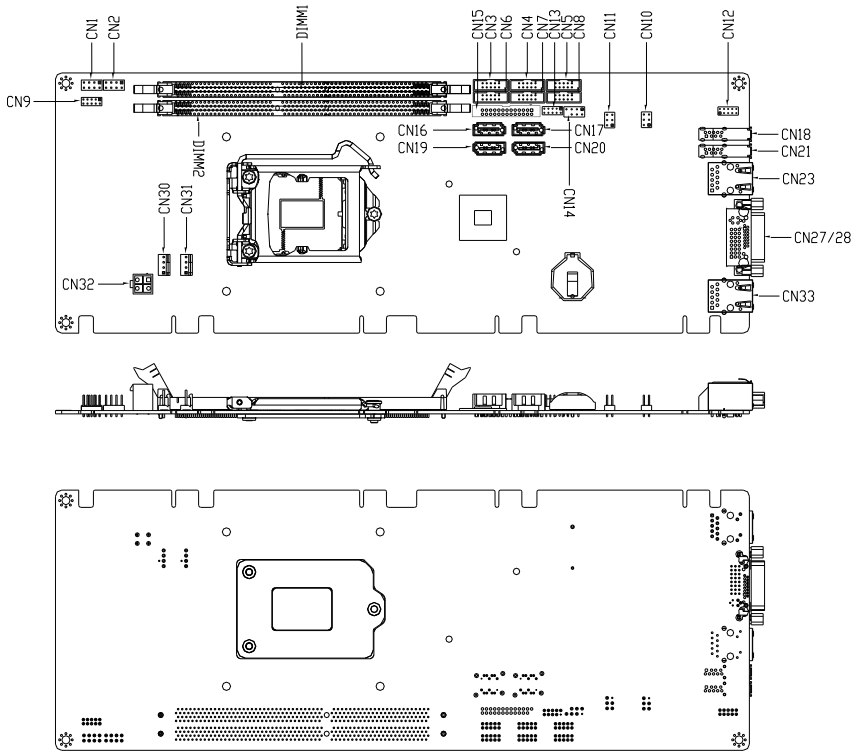
Quick Installation Guide

2.1 Safety Precautions

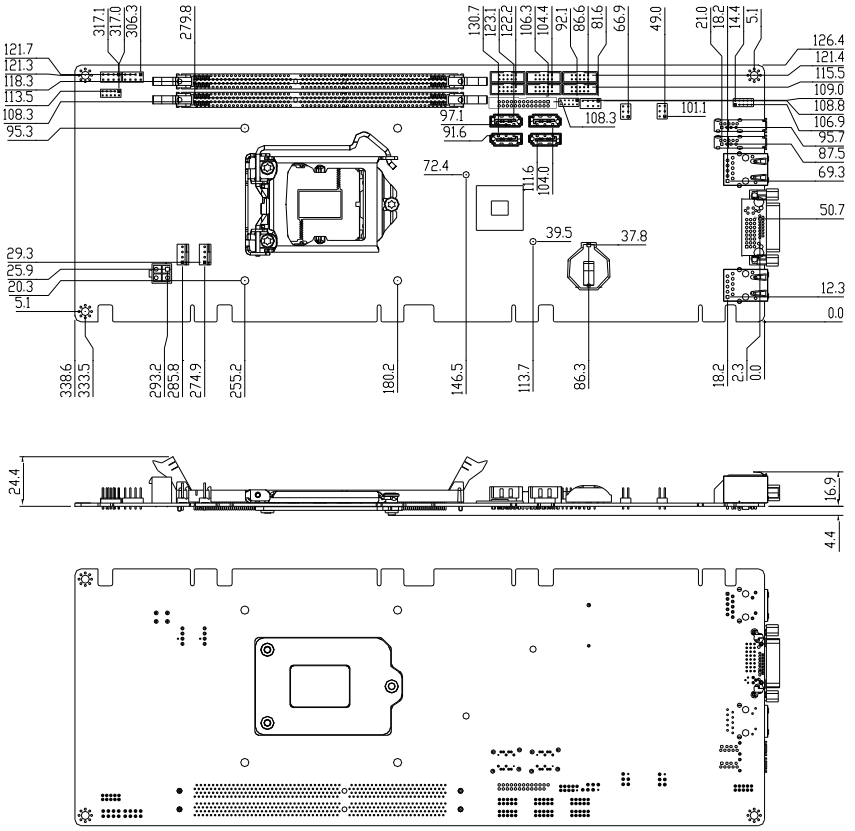
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers



2.3 Mechanical Drawing



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
CN10	COM1 RI/+5/+12V Selection
CN11	COM2 RI/+5/+12V Selection
CN24	Auto Power Button
CN29	CMOS RTC Setting
CN34	PCI Clock Feedback Setting

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

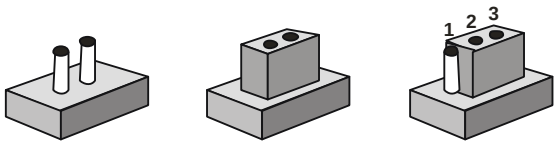
Label	Function
CN1	Front Panel Connector 1
CN2	Front Panel Connector 2
CN3	COM Port 6
CN4	COM Port 5
CN5	COM Port 4
CN6	COM Port 3

CN7	COM Port 2 (RS232/422/485)
CN8	COM Port 1 (RS232/422/485)
CN9	USB 2.0 Port 2/3
CN12	Digital IO Port
CN13	High Definition Audio
CN14	PS/2 Keyboard/Mouse
CN15	Parallel Port Pin Header
CN16	SATA Port 2
CN17	SATA Port 3
CN18	USB 3.0 Port 0
CN19	SATA Port 0
CN20	SATA Port 1
CN21	USB 3.0 Port 1
CN23	10M/100M/1G Ethernet Port 1
CN25	LPC Expansion Connector
CN26	SPI Programming Header
CN27	DVI Connector
CN28	VGA Connector
CN30	FAN2 Connector
CN31	FAN1 Connector
CN32	ATX +12V Power Connector
CN33	10M/100M/1G Ethernet Port 2
DIMM1	DDR3/DDR3L DIMM Slot
DIMM2	DDR3/DDR3L DIMM Slot

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



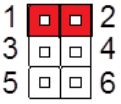
Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

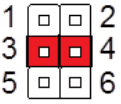
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

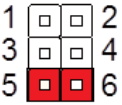
2.7 COM1 RI/+5/+12V Selection (CN10)



+12V



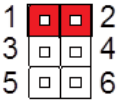
Ring



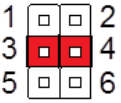
+5V

CN10	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

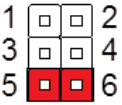
2.8 COM2 RI/+5/+12V Selection (CN11)



+12V



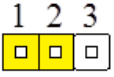
Ring



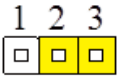
+5V

CN11	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.9 Auto Power Button (CN24)



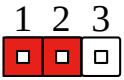
Power ON by Button



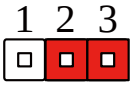
Auto Power ON

CN24	Function
1-2	Power ON by Button (Default)
2-3	Auto Power ON

2.10 CMOS RTC Setting (CN29)



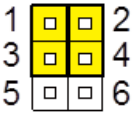
Normal



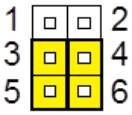
Clear CMOS

CN29	Function
1-2	**Normal** (Default)
2-3	**Clear CMOS**

2.11 PCI Clock Feedback Setting (CN34)



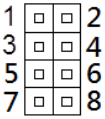
PCI Clock Feedback on backplane



PCI Clock Feedback on SHB

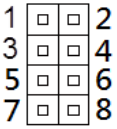
CN34	Function
1-3, 2-4	PCI Clock Feedback on Backplane (Default)
3-5, 4-6	PCI Clock Feedback on SHB

2.12 Front Panel Connector 1 (CN1)



Pin	Signal	Pin	Signal
1	PWR_BTN (+)	2	H/W RESET (+)
3	PWR_BTN (-)	4	H/W RESET (-)
5	HDD_LED (+)	6	PWR_LED (+)
7	HDD_LED (-)	8	PWR_LED (-)

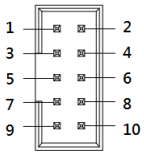
2.13 Front Panel Connector 2 (CN2)



Pin	Signal	Pin	Signal
1	External Speaker (+)	2	Key Board Lock (+)
3	NC	4	GND
5	Internal Buzzer (-)	6	SMB_CLK
7	External Speaker (-)	8	SMB_DAT

Note: Closed Pin 5, 7: Internal Buzzer Enable

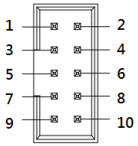
2.14 COM Port 6 (CN3)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	

2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI	IN	
10	NC		

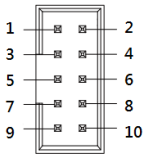
2.15 COM Port 5 (CN4)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	

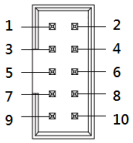
9	RI	IN	
10	NC		

2.16 COM Port 4 (CN5)



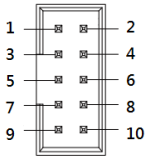
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI	IN	
10	NC		

2.17 COM Port 3 (CN6)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI	IN	
10	NC		

2.18 COM Port 2 (RS232/485/422) (CN7)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V

5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	+5V/+12V
10	NC		

RS-422

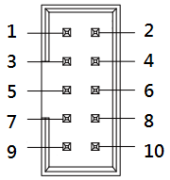
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	GND	GND	
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		

RS-485

Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3	NC		

4	NC		
5	GND	GND	
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		

2.19 COM Port 1 (RS232/485/422) (CN8)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	

9	RI/+5V/+12V	IN/ PWR	+5V/+12V
10	NC		

RS-422

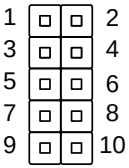
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	GND	GND	
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		

RS-485

Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3	NC		
4	NC		
5	GND	GND	
6	NC		
7	NC		

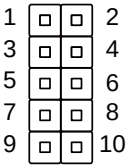
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		

2.20 USB 2.0 Port 2/3 (CN9)



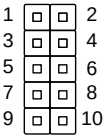
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB2_D-	DIFF	
4	GND	GND	
5	USB2_D+	DIFF	
6	USB3_D+	DIFF	
7	GND	GND	
8	USB3_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

2.21 Digital IO Port (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	DIO1	I/O	+5V
2	DIO2	I/O	+5V
3	DIO3	I/O	+5V
4	DIO4	I/O	+5V
5	DIO5	I/O	+5V
6	DIO6	I/O	+5V
7	DIO7	I/O	+5V
8	DIO8	I/O	+5V
9	+5V	PWR	+5V
10	GND	GND	

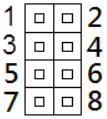
2.22 High Definition Audio (CN13)



Pin	Pin Name	Signal Type	Signal Level
1	HDA_RST#	OUT	

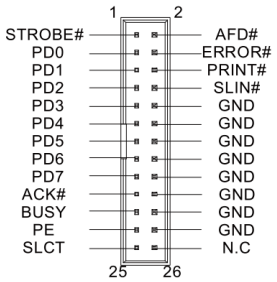
2	HDA_SYNC	OUT	
3	HDA_SDI0	IN	
4	HDA_SDO	OUT	
5	AUDIO_DET#	IN	
6	HDA_BCLK	OUT	
7	GND	GND	
8	+5V	PWR	+5V
9	+5VSB	PWR	+5V
10	+3.3V	PWR	+3.3V

2.23 PS/2 KB/MS Pin Header (CN14)



Pin	Pin Name	Signal Type	Signal Level
1	KB_ DATA	I/O	+5V
2	KB_CLK	I/O	+5V
3	GND	GND	
4	+5VSB	PWR	+5V
5	MS_DATA	I/O	+5V
6	MS_CLK	I/O	+5V
7	NC		
8	NC		

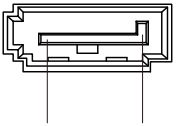
2.24 LPT Port (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	STROBE#	IN	
2	AFD#	I/O	
3	PD0	I/O	
4	ERROR#	IN	
5	PD1	I/O	
6	PRINT#	I/O	
7	PD2	I/O	
8	SLIN#	I/O	
9	PD3	I/O	
10	GND	GND	
11	PD4	I/O	
12	GND	GND	
13	PD5	I/O	
14	GND	GND	
15	PD6	I/O	

16	GND	GND
17	PD7	I/O
18	GND	GND
19	ACK#	IN
20	GND	GND
21	BUSY	IN
22	GND	GND
23	PE	IN
24	GND	GND
25	SLCT	IN
26	NC	

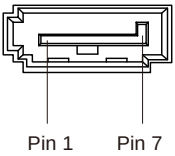
2.25 SATA Port 2 (CN16)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX4+	DIFF	
3	SATA_TX4-	DIFF	
4	GND	GND	
5	SATA_RX4-	DIFF	
6	SATA_RX4+	DIFF	

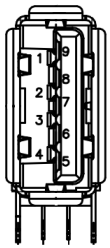
7	GND	GND	

2.26 SATA Port 3 (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX5+	DIFF	
3	SATA_TX5-	DIFF	
4	GND	GND	
5	SATA_RX5-	DIFF	
6	SATA_RX5+	DIFF	
7	GND	GND	

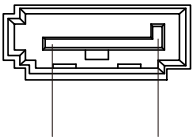
2.27 USB 3.0 Port 0 (CN18)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V

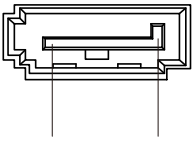
2	USB0_D-	DIFF
3	USB0_D+	DIFF
4	GND	GND
5	USB1_SSRX−	DIFF
6	USB1_SSRX+	DIFF
7	GND	GND
8	USB1_SSTX−	DIFF
9	USB1_SSTX+	DIFF

2.28 SATA Port 0 (CN19)



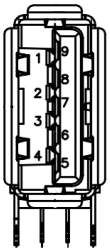
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX0+	DIFF	
3	SATA_TX0-	DIFF	
4	GND	GND	
5	SATA_RX0-	DIFF	
6	SATA_RX0+	DIFF	
7	GND	GND	

2.29 SATA Port 1 (CN20)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX1+	DIFF	
3	SATA_TX1-	DIFF	
4	GND	GND	
5	SATA_RX1-	DIFF	
6	SATA_RX1+	DIFF	
7	GND	GND	

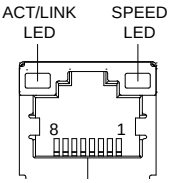
2.30 USB 3.0 Port 1 (CN21)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	

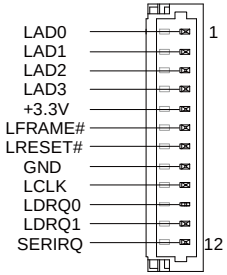
2	USB1_D-	DIFF
3	USB1_D+	DIFF
4	GND	GND
5	USB2_SSRX−	DIFF
6	USB2_SSRX+	DIFF
7	GND	GND
8	USB2_SSTX−	DIFF
9	USB2_SSTX+	DIFF

2.31 10M/100M/1G Ethernet Port 1 (CN23)



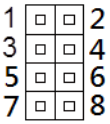
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.32 LPC Expansion Connector (CN25)



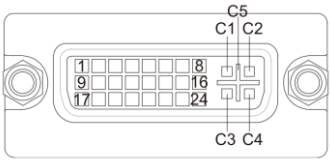
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

2.33 SPI Programming Header (Debug ONLY) (CN26)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	+3.3V
2	GND	GND	
3	CS#	I/O	
4	CLK	I/O	
5	SO	I/O	
6	SI	I/O	
7	NC		
8	NC		

2.34 DVI Connector (CN27)

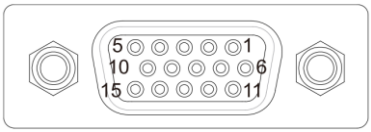


Pin	Pin Name	Signal Type	Signal Level
1	TMDS_DAT2-	DIFF	
2	TMDS_DAT2+	DIFF	

3	GND	GND	
4	VGA_DDC_CLK	I/O	
5	VGA_DDC _DATA	I/O	
6	DVI_DDC_CLK	I/O	+5V
7	DVI_DDC_DATA	I/O	+5V
8	VSYNC	OUT	
9	TMDS_DAT1-	DIFF	
10	TMDS_DAT1+	DIFF	
11	GND	GND	
12	NC		
13	NC		
14	+5V	PWR	+5V
15	GND	GND	
16	HPLG_DETECT	IN	
17	TMDS_DAT0-	DIFF	
18	TMDS_DAT0+	DIFF	
19	GND	GND	
20	NC		
21	NC		
22	GND	GND	
23	TMDS_CLK+	DIFF	
24	TMDS_CLK-	DIFF	
C1	RED	OUT	
C2	GREEN	OUT	

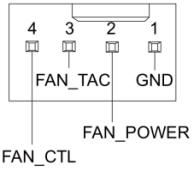
C3	BLUE	OUT	
C4	HSYNC	OUT	
C5	GND_ANALOG	GND	

2.35 VGA Connector (CN28)



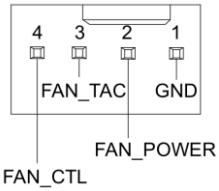
Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

2.36 FAN2 Connector (CN30)



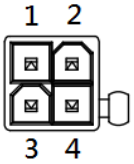
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	
4	FAN_CTL	OUT	

2.37 FAN1 Connector (CN31)



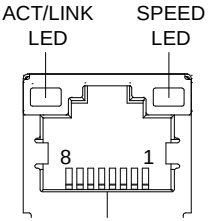
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	
4	FAN_CTL	OUT	

2.38 ATX +12V Power Connector (CN32)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	GND	GND	
3	+12V	PWR	+12V
4	+12V	PWR	+12V

2.39 10M/100M/1G Ethernet Port 2 (CN33)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	

6	MDI1-	DIFF
7	MDI3+	DIFF
8	MDI3-	DIFF

2.40 DDR3/DDR3L DIMM Slot (DIMM1)

Standard specification.

2.41 DDR3/DDR3L DIMM Slot (DIMM2)

Standard specification.

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外部信号连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

Chapter

3

AMI BIOS Setup

3.1 System Test and Iinitialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The FSB-H81H CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del>or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

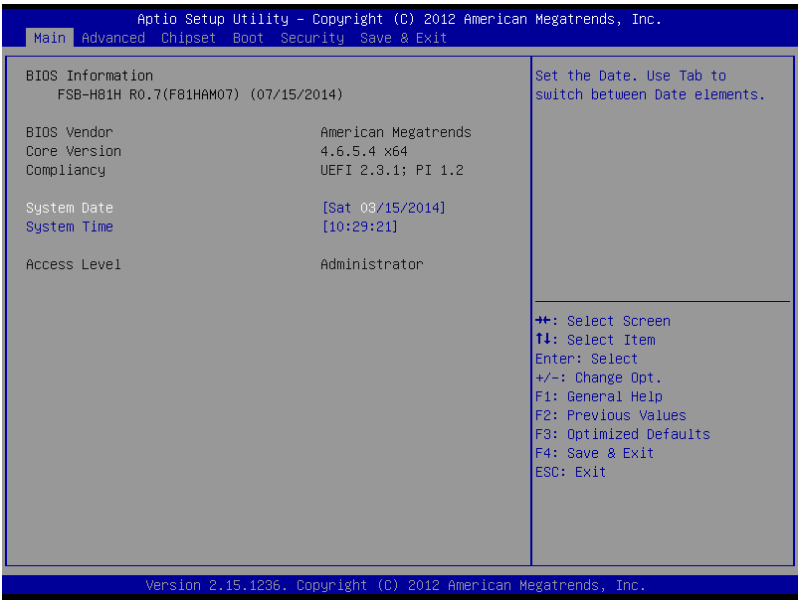
Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

Setup Menu

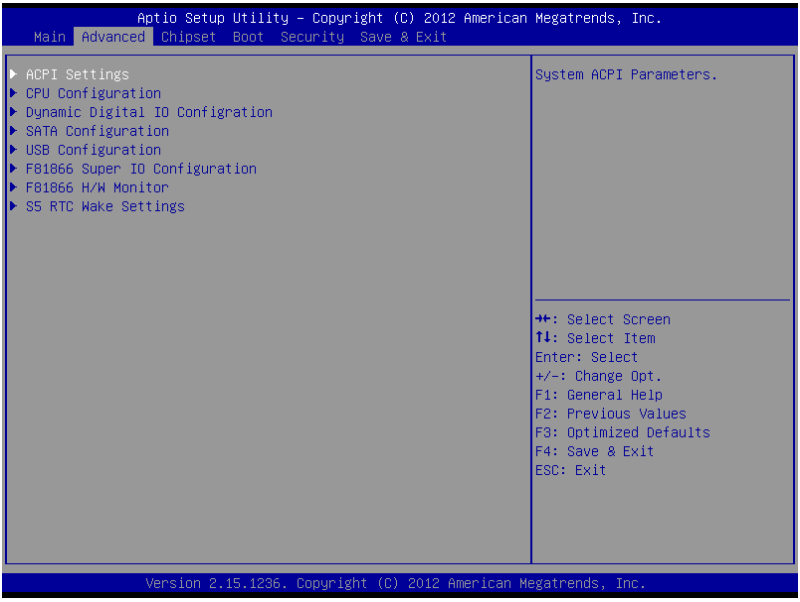
Setup submenu: Main



Options summary: (***default setting***)

System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

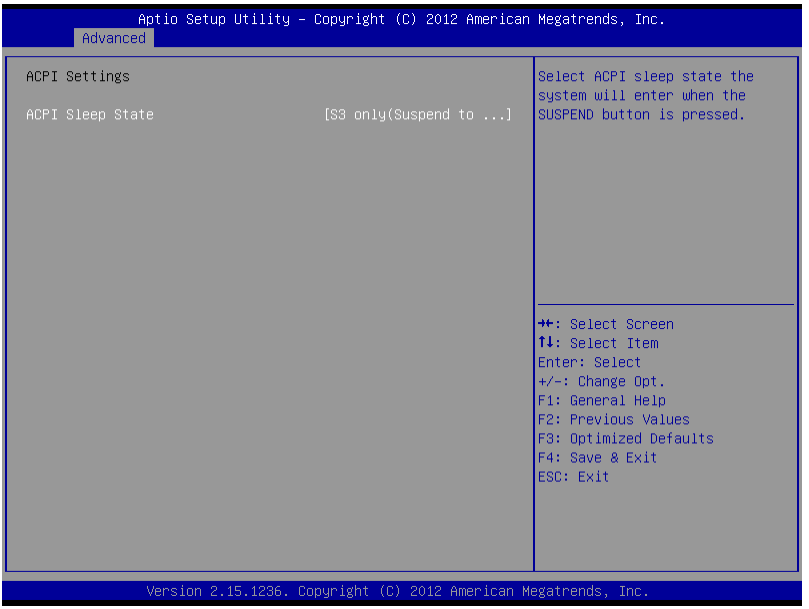


Options summary: (***default setting***)

ACPI Settings		
System ACPI Parameters		
CPU Configuration		
CPU Configuration Parameters		
Dynamic Digital IO		
Dynamic Digital IO settings		
SATA Configuration		
SATA Device Options Settings		
USB Configuration		

USB Configuration Parameters		
F81866 Super IO Configuration		
System Super IO Chip Parameters		
F81866 H/W Monitor		
Monitor hardware status		
S5 RTC Wake Settings		
Enable system to wake from S5 using RTC alarm		

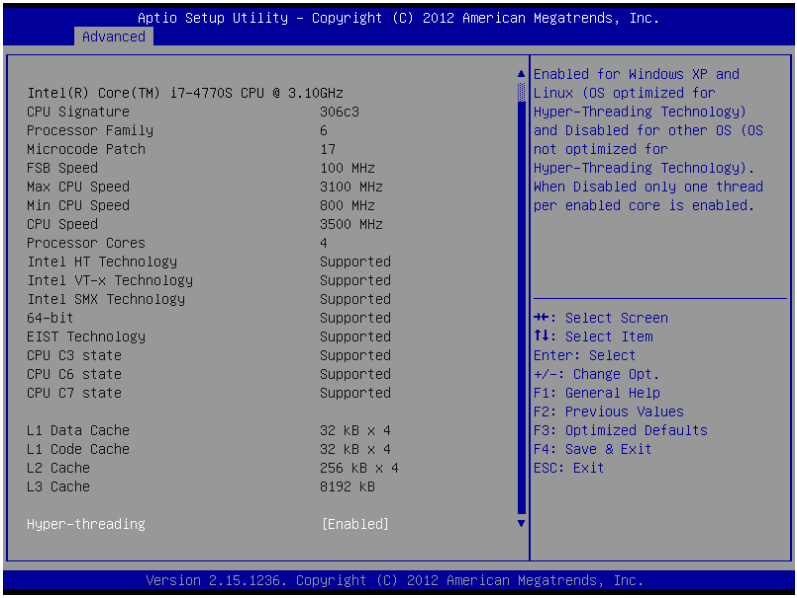
ACPI Settings



Options summary: (***default setting***)

ACPI Sleep State	Suspend Disabled	
	S1 only (CPU Stop Clock)	
	S3 (Suspend to RAM)	
	Both S1 and S3 available for OS to choose from	
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.		

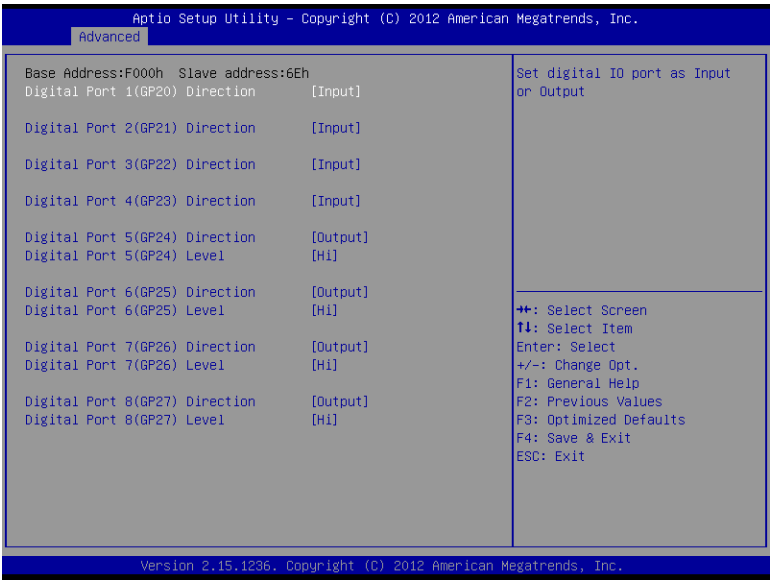
- CPU Configuration



Options summary: (***default setting***)

Hyper-threading	Disabled	
	Enabled	
Enabled/Disabled CPU Hyper-threading function.		

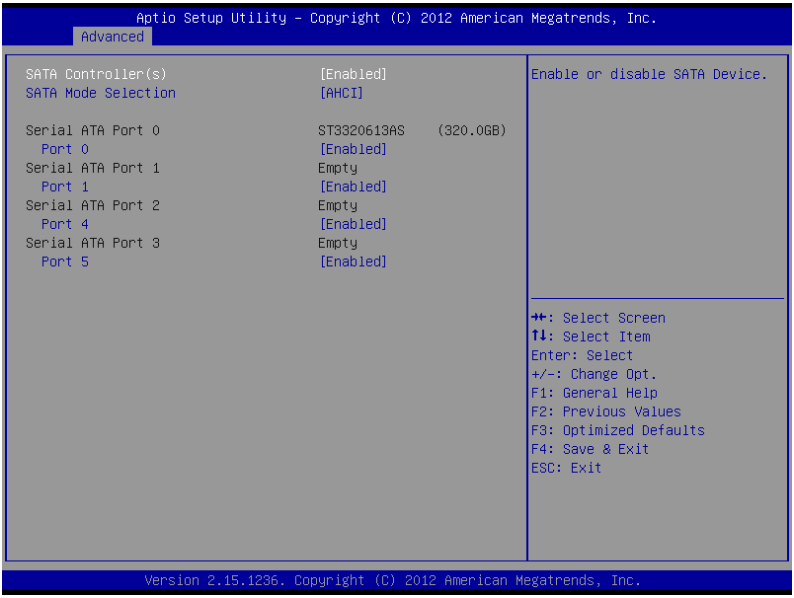
Dynamic Digital IO



Options summary: (***default setting***)

Digital Port x (GP2x) Direction	Input	
	Output	
Select GPIx/GPOx I/O direction		
Digital Port x (GP2x) Level	***Hi***	
	Low	
Select the output level when setting as Output ping.		

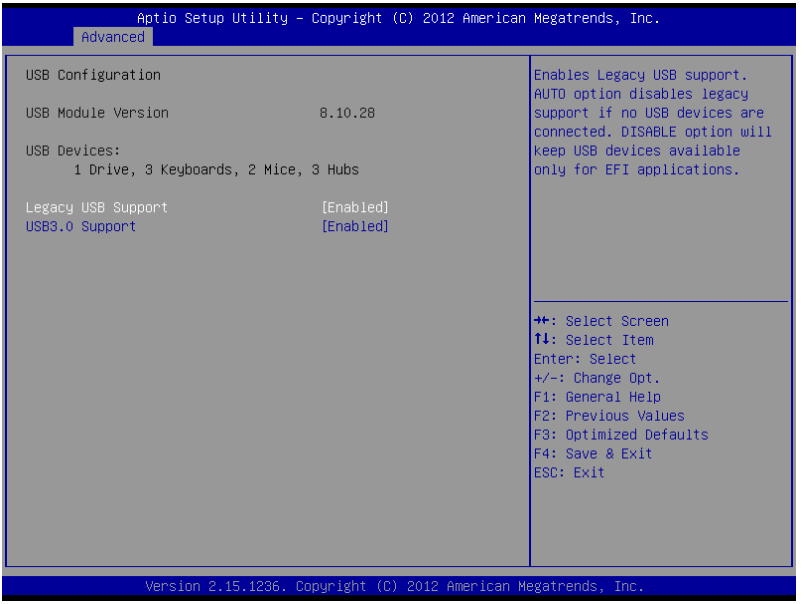
SATA Configuration



Options summary: (***default setting***)

SATA Controller(s)	***Enabled***	
	Disabled	
Configure SATA controller operating as Legacy IDE/AHCI mode.		
SATA Mode Selection	IDE	
	AHCI	
Configure SATA controller operating as Legacy IDE/AHCI mode.		

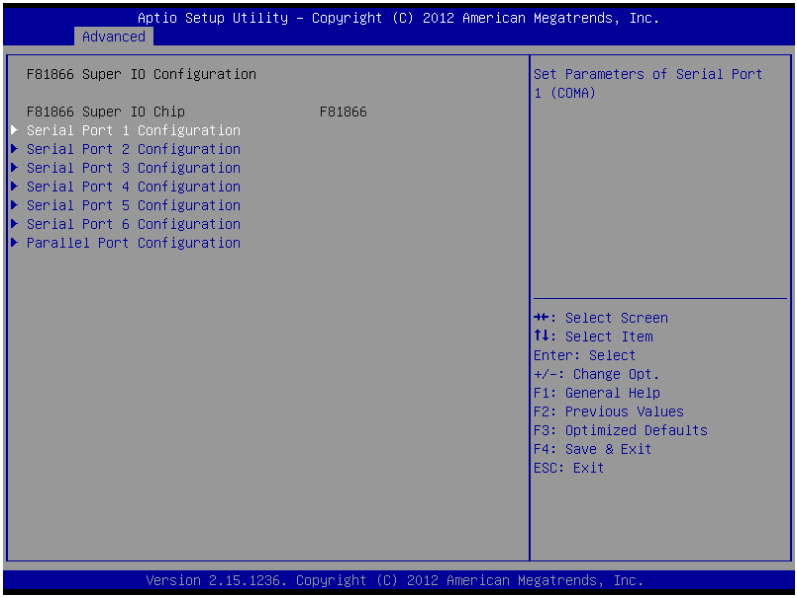
USB Configuration



Options summary: (***default setting***)

Legacy USB Support	***Enabled***	
	Disabled	
	Auto	
Enables Legacy USB Support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications		
USB3.0 Support	***Enabled***	
	Disabled	
Enable/Disable USB3.0 (XHCI) Controller support.		

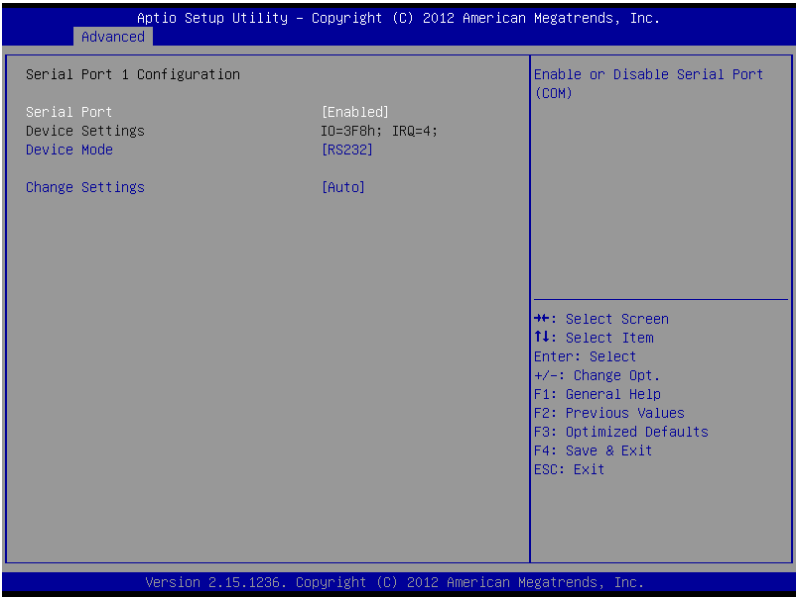
F81866 Super IO Configuration



Options summary: (***default setting***)

Serial Port x Configuration		
Set Parameters of Serial Port x.		
Parallel Port Configuration		
Set Parameters of Parallel Port		

Serial Port 1/2 Configuration

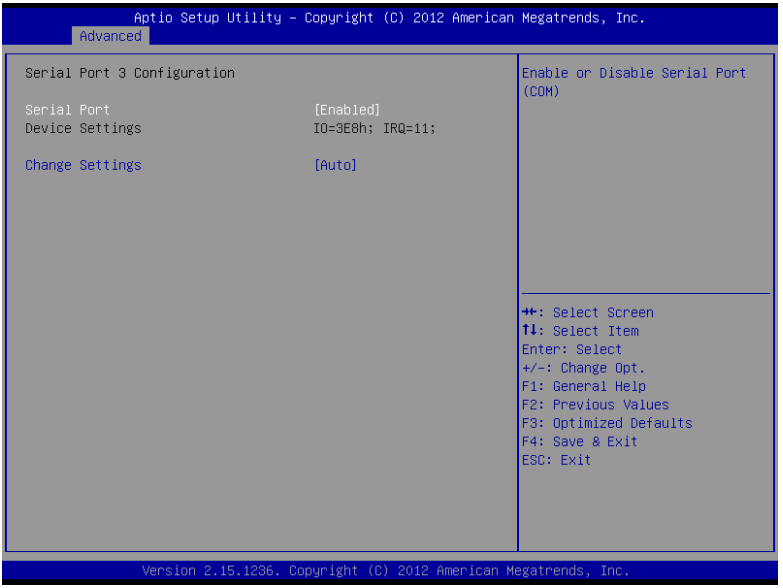


Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
Select an optimal setting for Super IO device.		
RS232/422/485	***RS232***	

	RS422	
	RS485	
Select an optimal setting for Super IO device.		

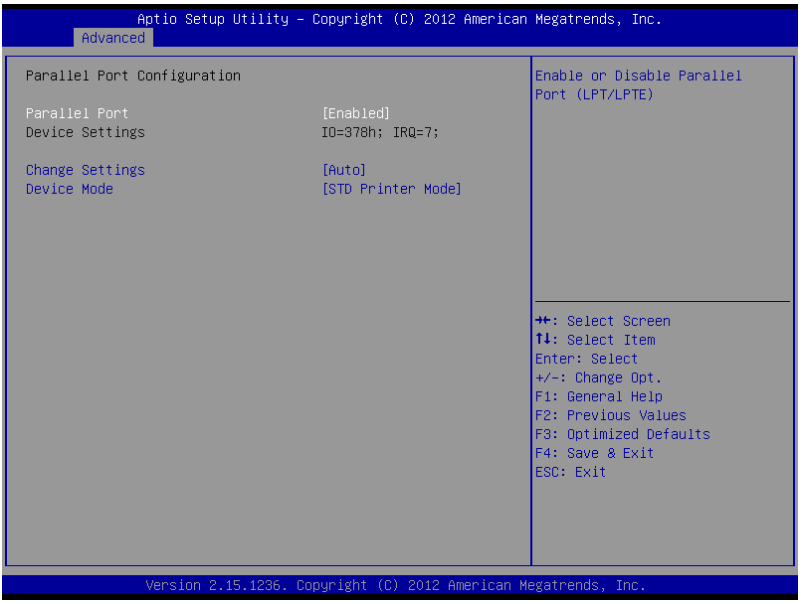
Serial Port 3/4/5/6 Configuration



Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
Select an optimal setting for Super IO device.		

Parallel Port Configuration

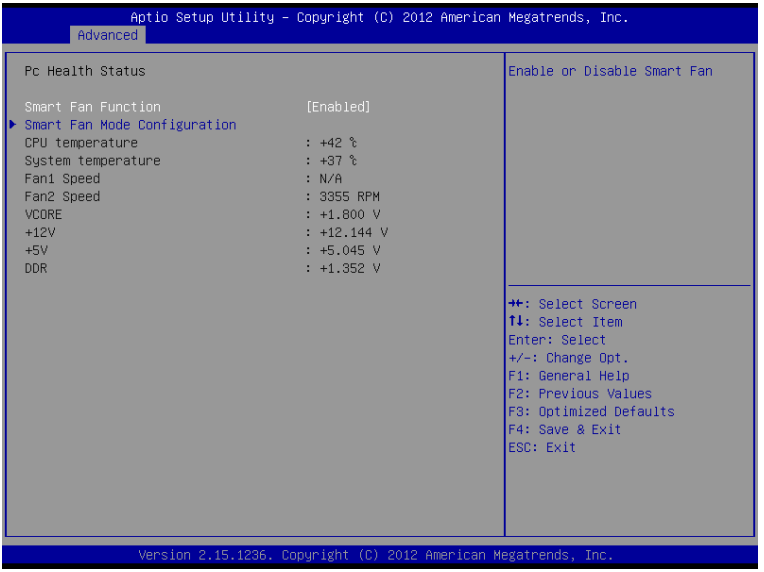


Options summary: (***default setting***)

Parallel Port	Disabled	
	Enabled	
En/Disable Parallel port.		
Change Settings	***Auto***	
	IO=378h; IRQ=5;	
	IO=378h; IRQ=5, 6, 7, 10, 11, 12;	
	IO=278h; IRQ=5, 6, 7, 10, 11, 12;	

	IO=3BCh; IRQ=5, 6, 7, 10, 11, 12;	
Select an optimal setting for Super IO device.		
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	
Select an optimal setting for Super IO device.		

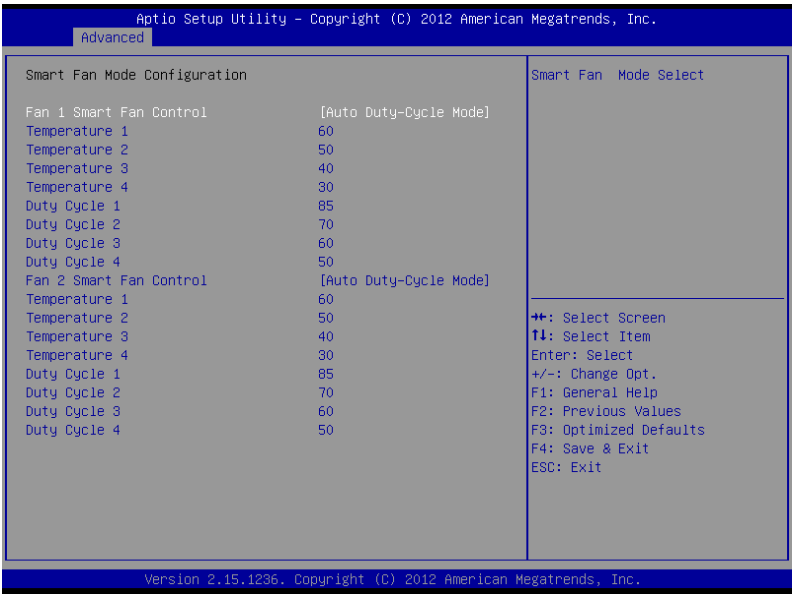
F81866 H/W Monitor



Options summary: (***default setting***)

Smart Fan Function	Disabled	
	Enabled	
En/Disable specified Smart Fan Function		
Smart Fan Mode Configuration		
Select an optimal setting for Smart Fan.		

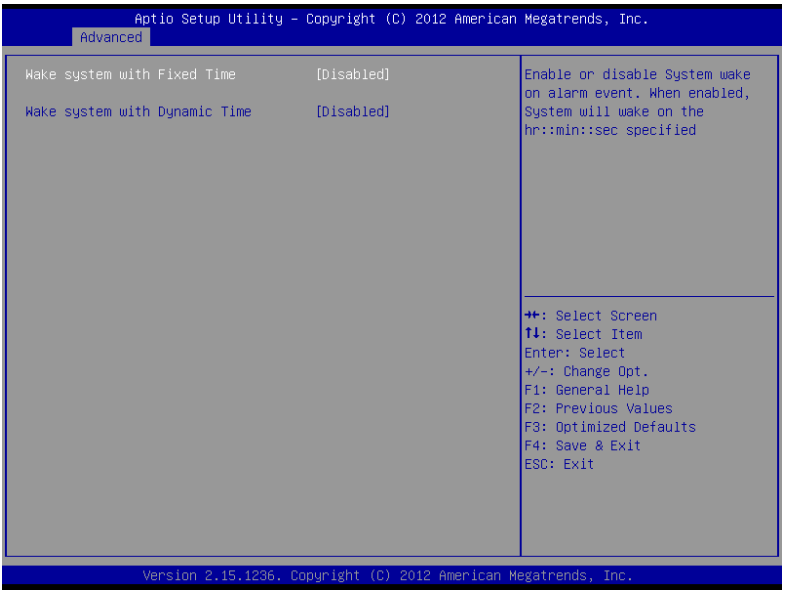
Smart Fan Mode Configuration



Options summary: (***default setting***)

Fan1 Smart Fan Control	Manual Duty Mode	
	Auto Duty-Cycle Mode	
Smart Fan Mode Select		
Manual Duty Mode		
Manual mode fan control, from 1-100.		
Temperature x		
Fan speed will follow different temperature by different duty cycle, from 1-100		
Duty Cycle x		
Fan speed will follow different temperature by different duty cycle, from 1-100		

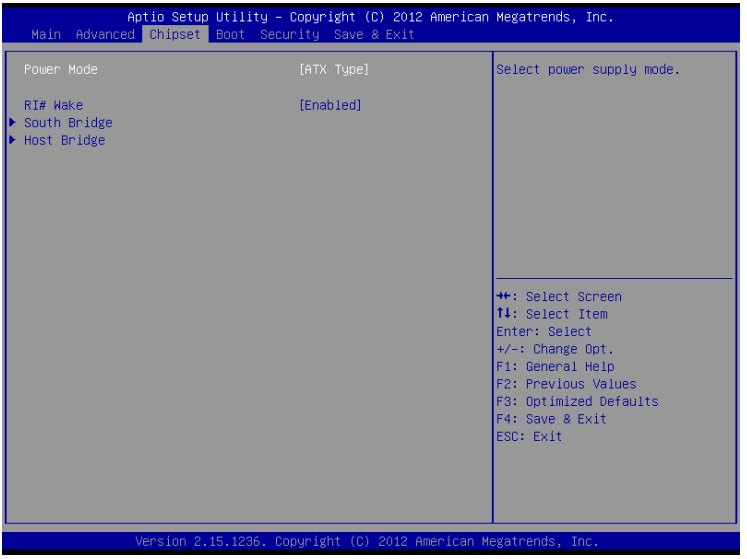
S5 RTC Wake Settings



Options summary: (***default setting***)

Wake system with Fixed Time	***Disabled***	
	Enabled	
Enable or disable system wake on alarm event. When enabled, System will wake on the hr::min::sec specified.		
Wake system with Dynamic Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. When enabled, System will wake on the current time + Increase minute(s).		

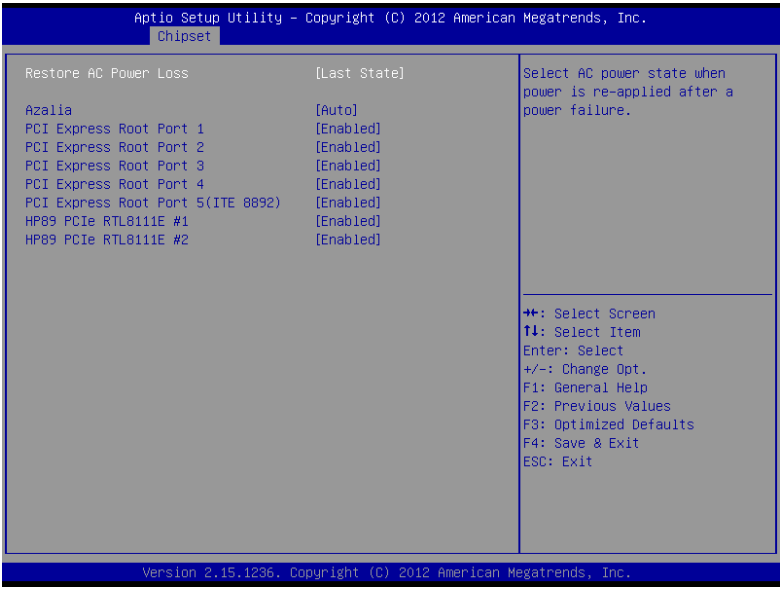
Setup submenu: Chipset



Options summary: (***default setting***)

Power Mode	***ATX Type***	
	AT	
Select power supply mode.		
RI# Wake	Disabled	
	Enabled	
Enable/Disable Ring In wake up function.		
South Bridge		
South Bridge Parameters		
Host Bridge		
North Bridge Parameters		

South Bridge

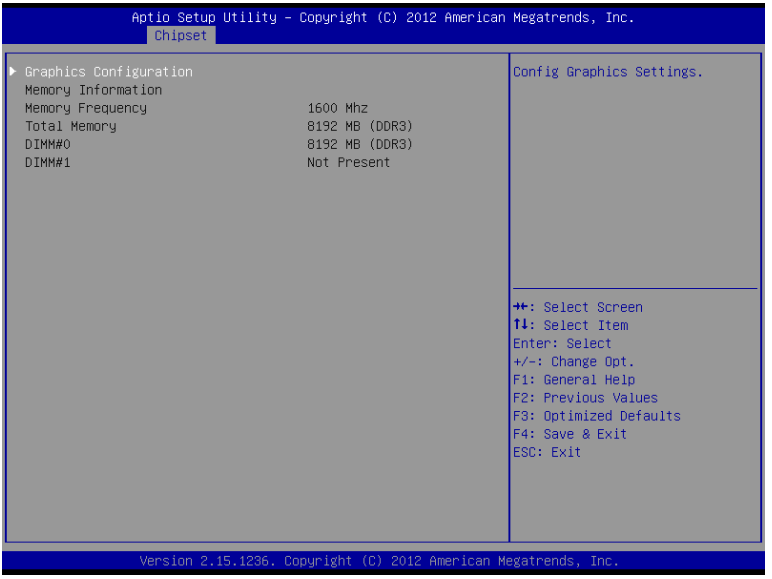


Options summary: (***default setting***)

Restore AC Power Loss	Power Off	
	Power On	
	Last State	
Select AC power state when power is re-applied after a power failure		
Azalia	Disabled	
	Enabled	
	Auto	
Options for SB HD Azalia.		

PCI Express Root Port x	Disabled	
	Enabled	
Control the PCI Express Root Port.		
HP89 PCIe RTL8111E #x	Disabled	
	Enabled	
Control on-board LAN device		

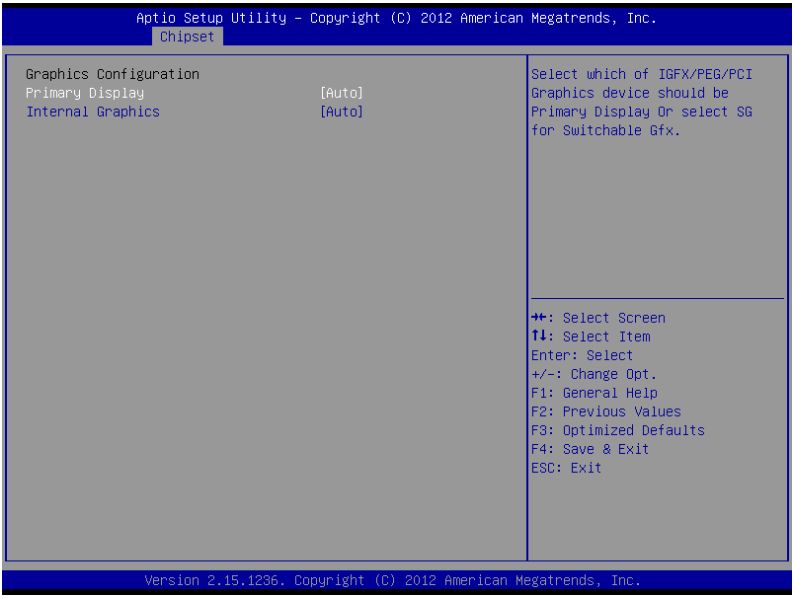
Host Bridge



Options summary: (***default setting***)

Graphics Configuration		
Configure Graphics Settings.		

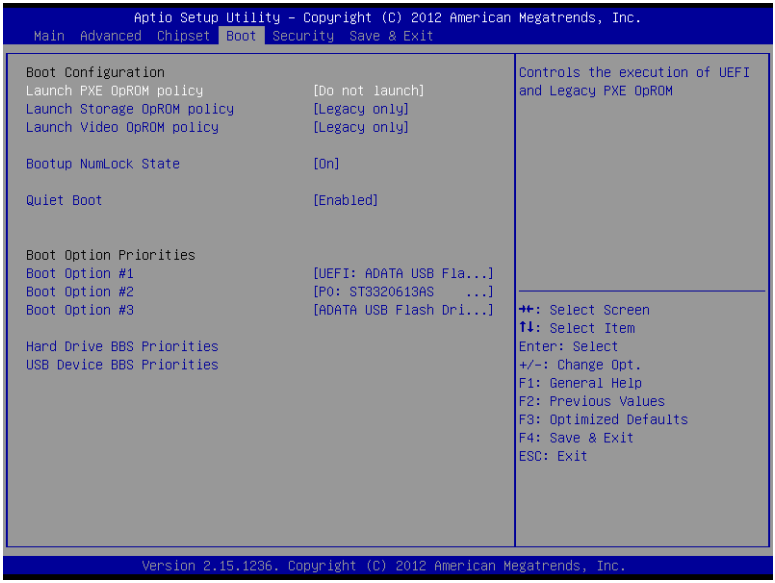
Graphics Configuration



Options summary: (***default setting***)

Primary Display	***Auto***	
	IGFX	
	PEG	
	PCIE	
Select which of IGFX/PEG/PCI Graphics device should be Primary Display		
Internal graphics	***Auto***	
	Disabled	
	Enabled	
Keep IGD enabled based on the setup options.		

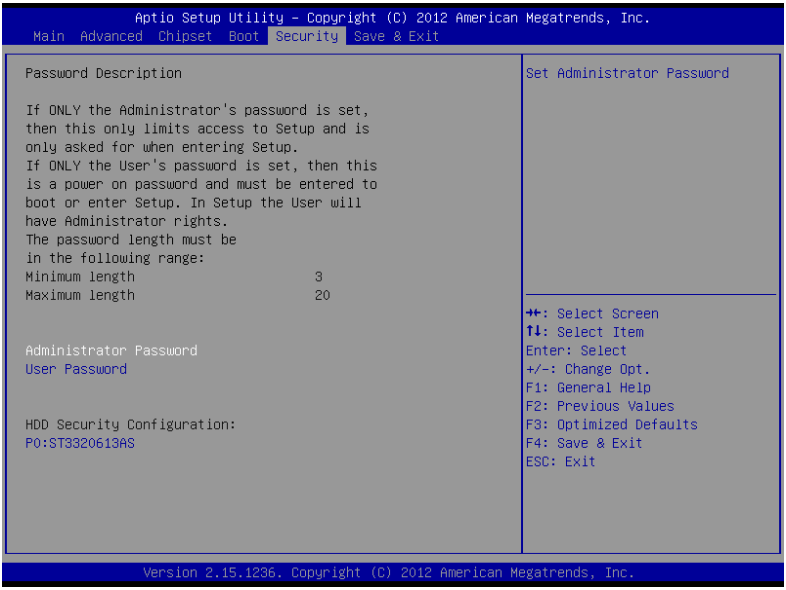
Setup submenu: Boot



Options summary: (***default setting***)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch PXE OpROM.	***Disabled***	
	Enabled	
En/Disable PXE boot for RTL8111E LAN		
Boot Option #x		
Set the system boot order.		
Hard Drive BBS Priorities		
Set the order of the legacy devices in this group		

Setup submenu: Security



Options summary: (***default setting***)

Administrator Password/ User Password	***Not set***	

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

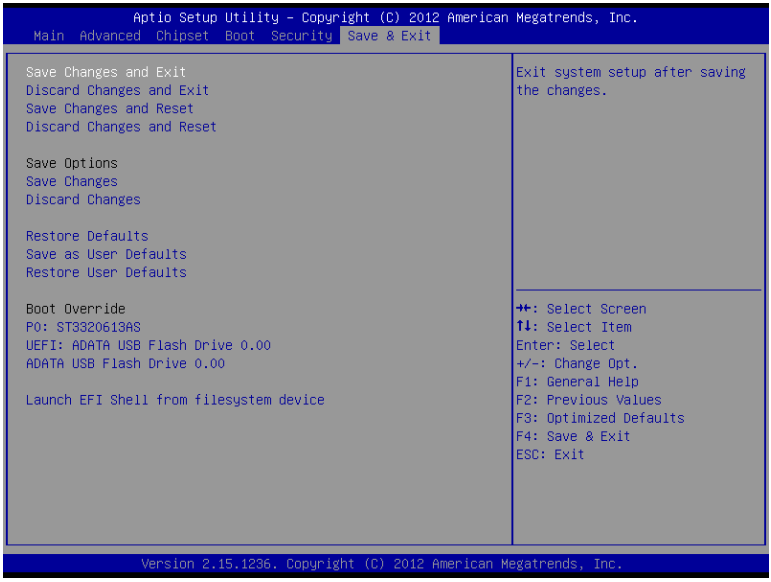
Install the Password:

Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password:

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Save & Exit



Options summary: (***default setting***)

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		
Save the changes done so far as User Defaults		
Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter

4

Driver Installation

The FSB-H81H comes with a DVD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install USB3.0 Driver

Step 4 – Install Audio Driver

Step 5 – Install LAN Driver

Step 6 – Install ME Driver

Step 7 – Install UART Driver

4.1 Installation:

Insert the FSB-H81H DVD-ROM into the DVD-ROM Drive. And install the drivers from Step 1 to Step 7 in order.

Step 1 – Install Chipset Driver

1. Click on the ***STEP1-Chipset*** folder and double click on the ***infinst_autol_9.4.0.1027.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the ***STEP2-Graphic*** folder and select the OS folder your system is
2. Double click on the ***Setup.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install USB3.0 Driver

1. Click on the ***STEP3-USB3.0*** folder and double click on the ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 – Install Audio Driver

1. Click on the ***STEP4-Audio*** folder and double click on the ***Vista_Win7_Win8_R271.exe*** file

2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install LAN Driver

1. Click on the ***STEP5-LAN*** folder and select the OS folder your system is
2. Double click on the ***setup.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

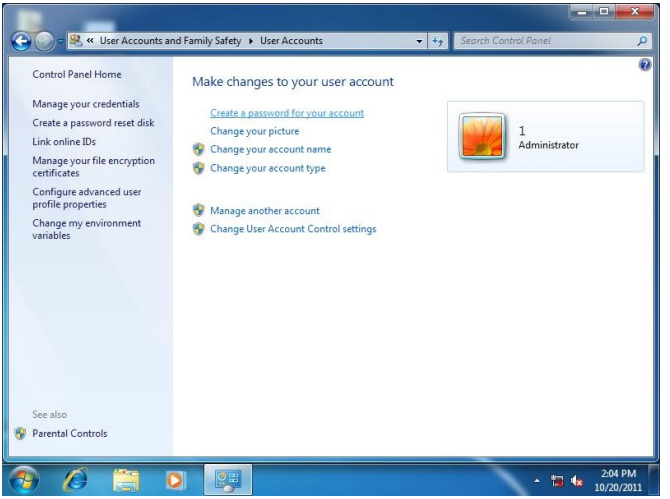
Step 6 – Install ME Driver

1. Click on the ***STEP6-ME*** folder and double click on the ***setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

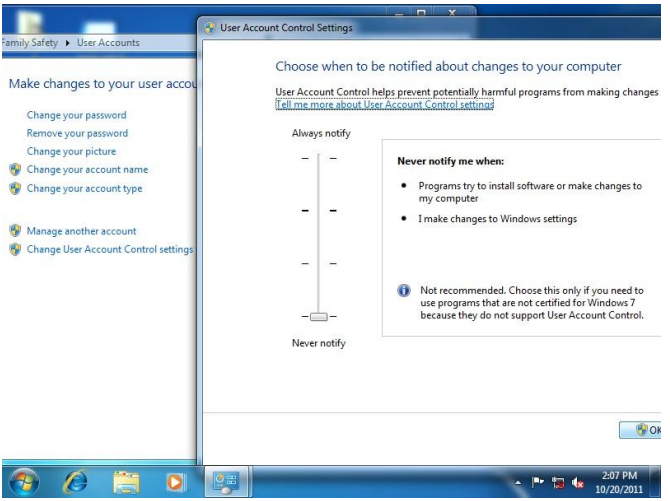
Step 7 – Install UART Driver

Windows 7

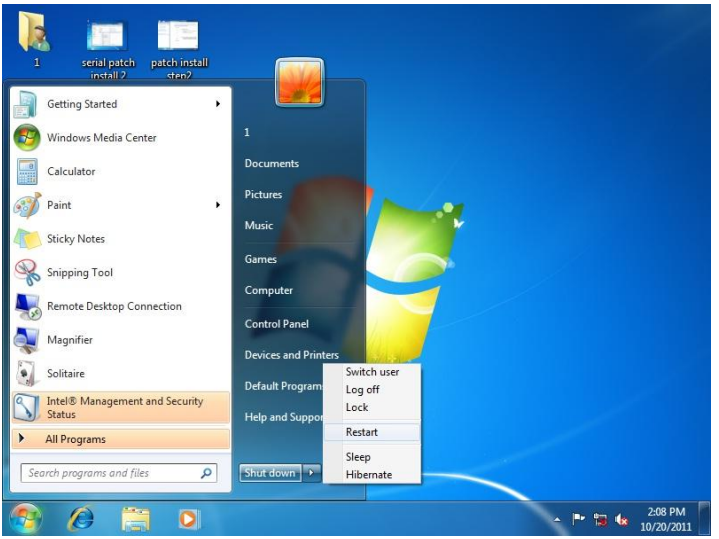
Step 1:



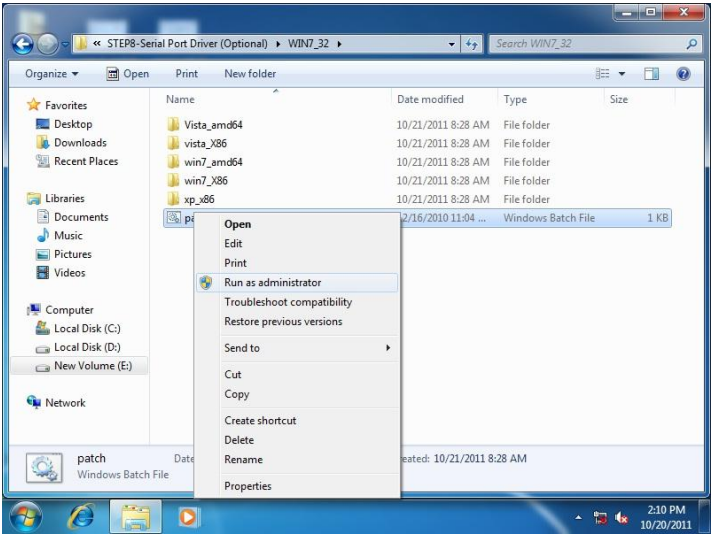
Step 2:



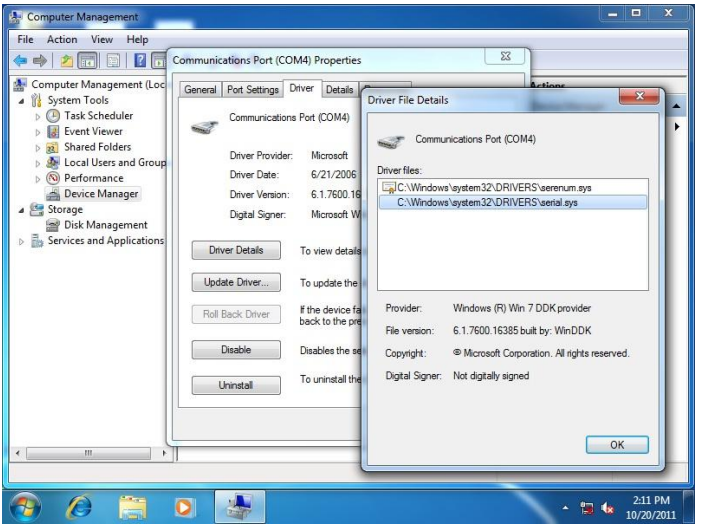
Step 3:


1
serial patch install 2
patch install step2
Getting Started
Windows Media Center
Calculator
Paint
Sticky Notes
Snipping Tool
Remote Desktop Connection
Magnifier
Solitaire
Intel® Management and Security Status
All Programs
Search programs and files
1
Documents
Pictures
Music
Games
Computer
Control Panel
Devices and Printers
Default Programs
Help and Support
Shut down
Switch user
Log off
Lock
Restart
Sleep
Hibernate
2:08 PM
10/20/2011

Step 4:

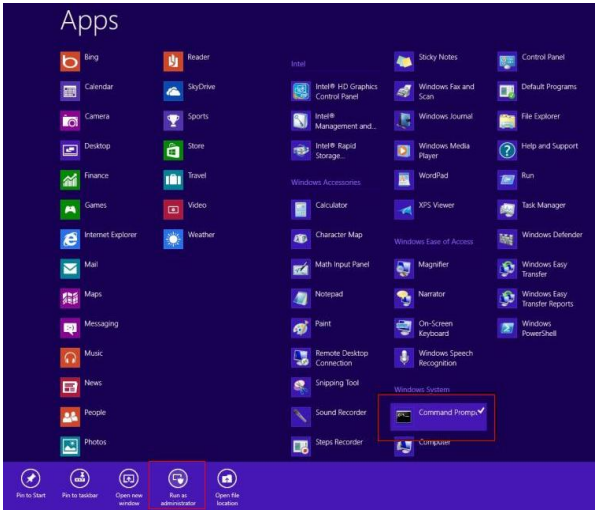

« STEP8-Serial Port Driver (Optional) ▸ WIN7_32 ▸
Search WIN7_32
Organize
Open
Print
New folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Local Disk (C:)
Local Disk (D:)
New Volume (E:)
Network
Name
Date modified
Type
Size
Vista_amd64
vista_X86
win7_amd64
win7_X86
xp_x86
10/21/2011 8:28 AM
File folder
Windows Batch File
1 KB
Open
Edit
Print
Run as administrator
Troubleshoot compatibility
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
patch
Windows Batch File
2:10 PM
10/20/2011

Step 5:

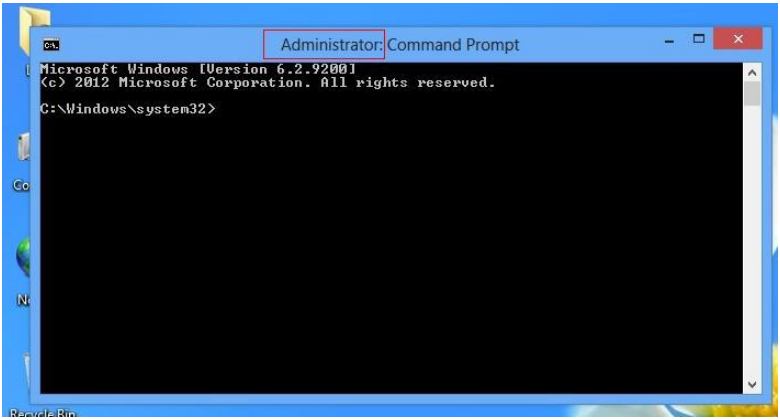


Windows 8

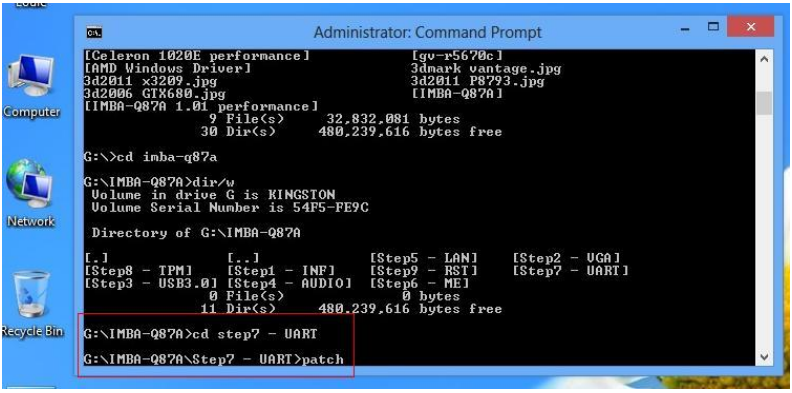
Step 1:



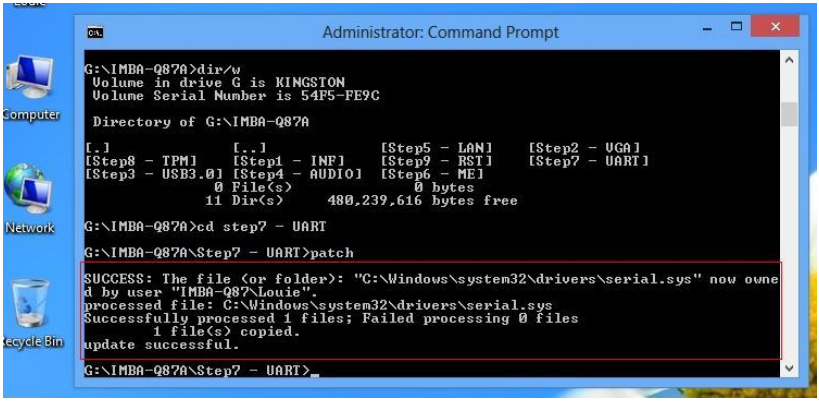
Step 2:


Administrator: Command Prompt
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.
C:\Windows\system32>

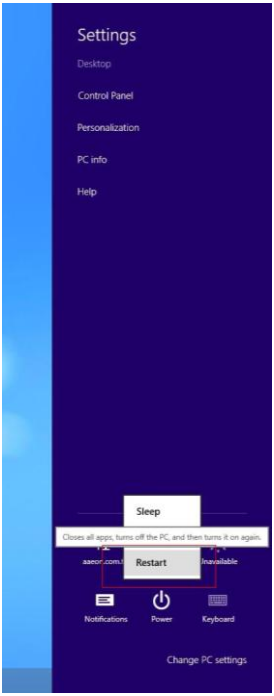
Step 3:


Administrator: Command Prompt
[Celeron 1020E performance]
[AMD Windows Driver]
3d2011 x3209.jpg
3d2006 GTX680.jpg
[IMBA-Q87A 1.01 performance]
9 File(s) 32,832,081 bytes
30 Dir(s) 480,239,616 bytes free
G:\>cd imba-q87a
G:\IMBA-Q87A>dir/w
Volume in drive G is KINGSTON
Volume Serial Number is 54F5-FE9C
Directory of G:\IMBA-Q87A
[.] [..] [Step5 - LAN] [Step2 - VGA]
[Step8 - TPM] [Step1 - INF] [Step9 - RST] [Step7 - UART]
[Step3 - USB3.0] [Step4 - AUDIO] [Step6 - ME]
0 File(s) 0 bytes
11 Dir(s) 480,239,616 bytes free
G:\IMBA-Q87A>cd step7 - UART
G:\IMBA-Q87A\Step7 - UART>patch
[gv-r5670c]
3dmark vantage.jpg
3d2011 P8793.jpg
[IMBA-Q87A]
Computer
Network
Recycle Bin

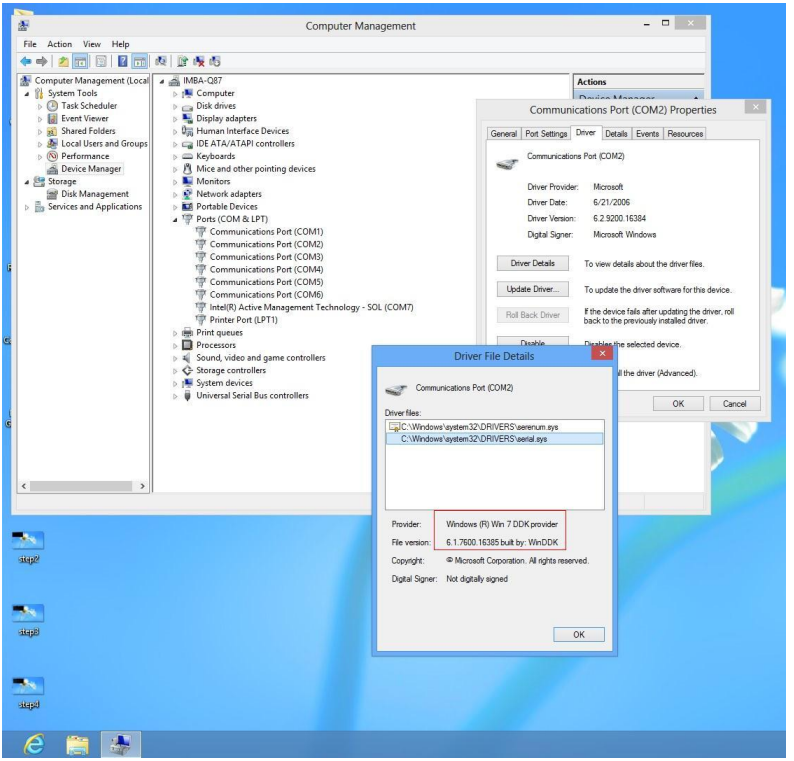
Step 4:


Administrator: Command Prompt
G:\IMBA-Q87A>dir/w
Volume in drive G is KINGSTON
Volume Serial Number is 54F5-FE9C
Directory of G:\IMBA-Q87A
[.] [..] [Step5 - LAN] [Step2 - VGA]
[Step8 - TPM] [Step1 - INF] [Step9 - RST] [Step7 - UART]
[Step3 - USB3.0] [Step4 - AUDIO] [Step6 - ME]
0 File(s) 0 bytes
11 Dir(s) 480,239,616 bytes free
G:\IMBA-Q87A>cd step7 - UART
G:\IMBA-Q87A\Step7 - UART>patch
SUCCESS: The file (or folder): "C:\Windows\system32\drivers\serial.sys" now owned by user "IMBA-Q87\Louie".
processed file: C:\Windows\system32\drivers\serial.sys
Successfully processed 1 files; Failed processing 0 files
1 file(s) copied.
update successful.
G:\IMBA-Q87A\Step7 - UART>
Computer
Network
Recycle Bin

Step 5:


Settings
Desktop
Control Panel
Personalization
PC info
Help
Sleep
Restart
Notifications
Power
Keyboard
Change PC settings

Step 6:


Computer Management
File Action View Help
Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
IMBA-Q87
Computer
Disk drives
Display adapters
Human Interface Devices
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Portable Devices
Ports (COM & LPT)
Communications Port (COM1)
Communications Port (COM2)
Communications Port (COM3)
Communications Port (COM4)
Communications Port (COM5)
Communications Port (COM6)
Intel(R) Active Management Technology - SOL (COM7)
Printer Port (LPT1)
Print queues
Processors
Sound, video and game controllers
Storage controllers
System devices
Universal Serial Bus controllers
Actions
Communications Port (COM2) Properties
General Port Settings Driver Details Events Resources
Communications Port (COM2)
Driver Provider: Microsoft
Driver Date: 6/21/2006
Driver Version: 6.2.9200.16384
Digital Signer: Microsoft Windows
Driver Details
To view details about the driver files.
Update Driver...
To update the driver software for this device.
Roll Back Driver
If the device fails after updating the driver, roll back to the previously installed driver.
Disable
Disables the selected device.
OK
Cancel
Driver File Details
Communications Port (COM2)
Driver files:
C:\Windows\system32\DRIVERS\serenum.sys
C:\Windows\system32\DRIVERS\serial.sys
Provider: Windows (R) Win 7 DDK provider
File version: 6.1.7600.16385 built by: WinDDK
Copyright: © Microsoft Corporation. All rights reserved.
Digital Signer: Not digitally signed
OK
step2
step3
step4

Appendix

A

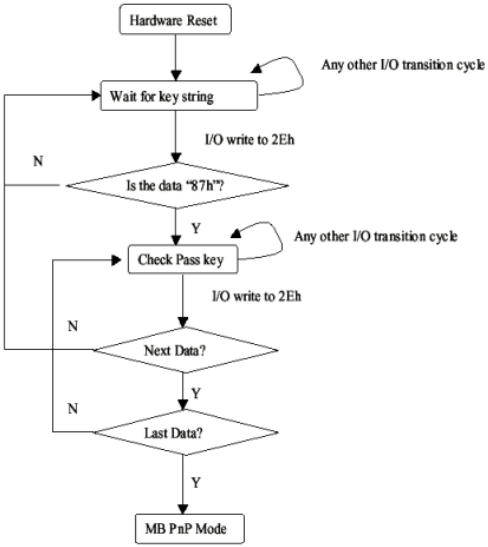
Programming the Watchdog Timer

A.1 Programming

FSB-H81H utilizes FINTEK 81866 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the FINTEK 81866 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write opera-tions to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

```
-o 4e 87
-o 4e 87          ( enable configuration )
```

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Write exit key 0xAA to the index port.

```
-o 4e aa          ( disable configuration )
```

Watch Dog Timer 1, 2, 3 Control Register (Index=F5h,F6h,FAh Default=00h)

7.8.4 Watchdog Control Configuration Register 1 — Index F5h

Bit	Name	R/W	Reset	Default	Description
7	Reserved	R	-	0	Reserved
6	WDTMOUT_STS	R/W	5VSB	0	If watchdog timeout event occurred, this bit will be set to 1. Write a 1 to this bit will clear it to 0.
5	WD_EN	R/W	5VSB	0	If this bit is set to 1, the counting of watchdog time is enabled.
4	WD_PULSE	R/W	5VSB	0	Select output mode (0: level, 1: pulse) of RSTOUT# by setting this bit.
3	WD_UNIT	R/W	5VSB	0	Select time unit (0: 1sec, 1: 60 sec) of watchdog timer by setting this bit.
2	WD_HACTIVE	R/W	5VSB	0	Select output polarity of RSTOUT# (1: high active, 0: low active) by setting this bit.
1-0	WD_PSWIDTH	R/W	5VSB	0	Select output pulse width of RSTOUT# 0: 1 ms 1: 25 ms 2: 125 ms 3: 5 sec

7.8.5 Watchdog Timer Configuration Register 2 — Index F6h

Bit	Name	R/W	Reset	Default	Description
7-0	WD_TIME	R/W	5VSB	0	Time of watchdog timer (0~255)

7.8.6 Watchdog PME Enable Configuration Register 2 — Index FAh

Bit	Name	R/W	Reset	Default	Description
7	WDT_PME	R	5VSB	0	0: No WDT PME occurred. 1: WDT PME occurred. The WDT PME is occurred one unit before WDT timeout.
6	WDT_PME_EN	R/W	5VSB	0	0: Disable Watchdog PME. 1: enable Watchdog PME.
5	Reserved	R	-	0	Reserved
4	WDT_CLK_SEL	R/W	5VSB	1	WDT Clock Source Select 0: Internal 1KHz clock. 1: 1KHZ clock driven by CLKIN.
3-1	Reserved	R	-	0	Reserved
0	WDOUT_EN	R/W	5VSB	0	0: disable Watchdog time out output via WDTRST#. 1: enable Watchdog time out output via WDTRST#.

A.2 F81866 Watchdog Timer Initial Program

```
Main(){
aaeonSuperIOOpen();
aaeonWdtSetCountMode(BOOL bMinute); // Set wdt count mode
aaeonWdtSetTimeoutCount(BYTE tTimeout); // Set wdt timer
aaeonWdtSetEnable(BOOL bEnable); // Enable wdt
aaeonSuperIOClose();
}

Void aaeonSuperIOOpen(){    // Config F81866 Entry key
        aaeonioWritePortByte(F81866_INDEX, 0x87);
        aaeonioWritePortByte(F81866_INDEX, 0x87);
}

Void aaeonWdtSetCountMode(BOOL bMinute){
   BYTE WDT_CONTROL = f81866ReadByte(F81866_WDT_CONTROL_REG);
   if(bMinute)
        f81866WriteByte(F81866_WDT_CONTROL_REG, WDT_CONTROL | 0x08);
   else
        f81866WriteByte(F81866_WDT_CONTROL_REG, WDT_CONTROL & 0xF7);
}
```

```
Void aaeonWdtSetTimeoutCount(BYTE tTimeout){
   f81866SetLdn(0x07);
   f81866WriteByte(F81866_WDT_TIME_REG, tTimeout);
}

Void aaeonWdtSetEnable(BOOL bEnable){
   f81866SetLdn(0x07);
   if(bEnable){
        f81866WriteByte(0x30, 0x01);
        WDT_BASE_ADDR =
        (f81866ReadByte(F81866_WDT_BASEADDR_REG_MSB) << 8)
        | f81866ReadByte(F81866_WDT_BASEADDR_REG_LSB);
        WDT_STATUS = f81866ReadByte(F81866_WDT_CONTROL_REG);
        f81866WriteByte(F81866_WDT_CONTROL_REG, WDT_STATUS | 0x20);
        WDT_STATUS = f81866ReadByte(F81866_WDT_PME_REG);
        f81866WriteByte(F81866_WDT_PME_REG, WDT_STATUS | 0x01);
   }else{
        f81866WriteByte(0x30, 0x00);
        WDT_BASE_ADDR = 0;
        WDT_STATUS = f81866ReadByte(F81866_WDT_CONTROL_REG);
        f81866WriteByte(F81866_WDT_CONTROL_REG, WDT_STATUS & 0xDF);
        WDT_STATUS = f81866ReadByte(F81866_WDT_PME_REG);
        f81866WriteByte(F81866_WDT_PME_REG, WDT_STATUS & 0xFE);
   }
}
```

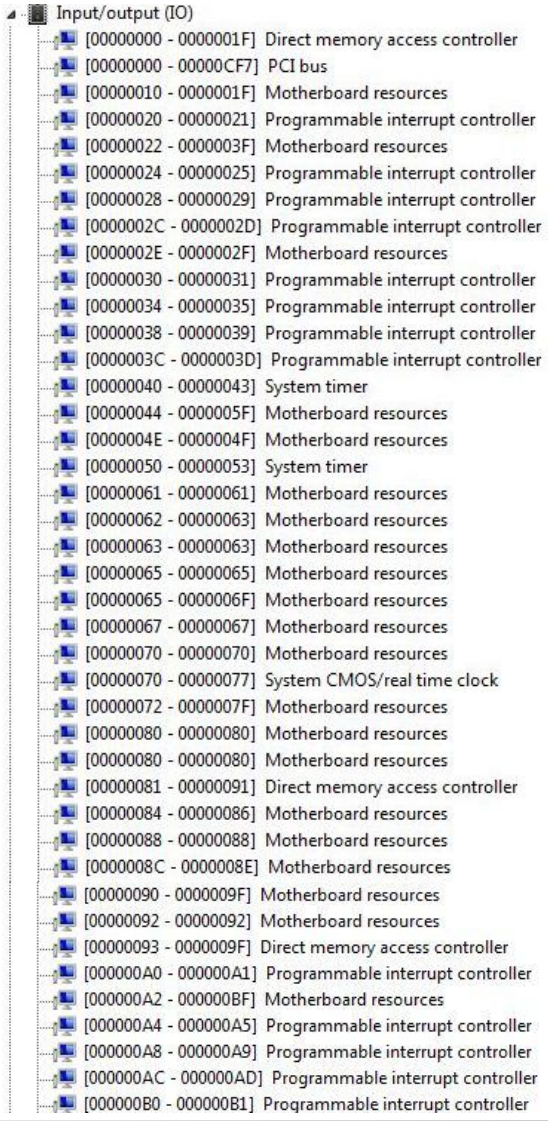
```
Void aaeonSuperIOClose(){
        aaeonioWritePortByte(F81866_INDEX, 0xaa);
}
```

Appendix

B

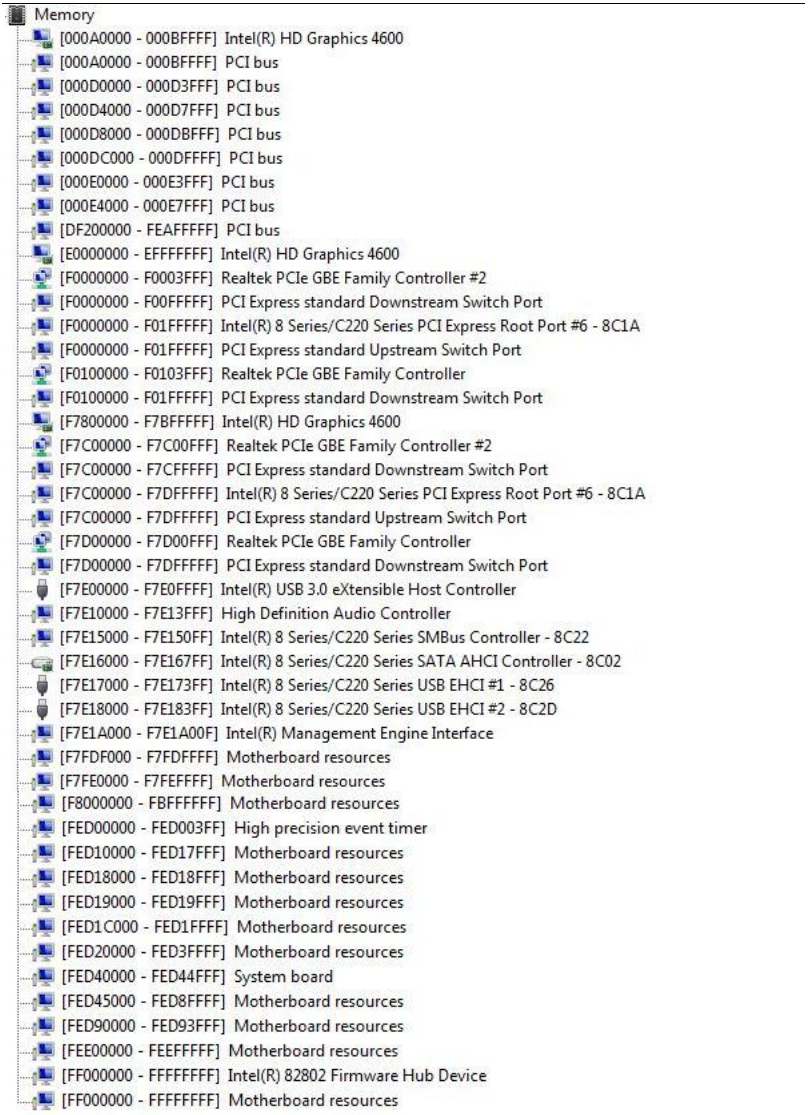
I/O Information

B.1 I/O Address Map



- [000000B2 - 000000B3] Motherboard resources
- [000000B4 - 000000B5] Programmable interrupt controller
- [000000B8 - 000000B9] Programmable interrupt controller
- [000000BC - 000000BD] Programmable interrupt controller
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000F0] Numeric data processor
- [000002C0 - 000002C7] Communications Port (COM6)
- [000002D0 - 000002D7] Communications Port (COM5)
- [000002E8 - 000002EF] Communications Port (COM4)
- [000002F8 - 000002FF] Communications Port (COM2)
- [00000378 - 0000037F] Printer Port (LPT1)
- [000003B0 - 000003BB] Intel(R) HD Graphics 4600
- [000003C0 - 000003DF] Intel(R) HD Graphics 4600
- [000003E8 - 000003EF] Communications Port (COM3)
- [000003F8 - 000003FF] Communications Port (COM1)
- [000004D0 - 000004D1] Motherboard resources
- [000004D0 - 000004D1] Programmable interrupt controller
- [00000680 - 0000069F] Motherboard resources
- [00000A00 - 00000A0F] Motherboard resources
- [00000A10 - 00000A1F] Motherboard resources
- [00000A20 - 00000A2F] Motherboard resources
- [00000D00 - 0000FFFF] PCI bus
- [0000164E - 0000164F] Motherboard resources
- [00001800 - 000018FE] Motherboard resources
- [00001854 - 00001857] Motherboard resources
- [00001C00 - 00001CFE] Motherboard resources
- [00001D00 - 00001DFE] Motherboard resources
- [00001E00 - 00001EFE] Motherboard resources
- [00001F00 - 00001FFE] Motherboard resources
- [0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #2
- [0000D000 - 0000DFFF] PCI Express standard Downstream Switch Port
- [0000D000 - 0000EFFF] Intel(R) 8 Series/C220 Series PCI Express Root Port #6 - 8C1A
- [0000D000 - 0000EFFF] PCI Express standard Upstream Switch Port
- [0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
- [0000E000 - 0000EFFF] PCI Express standard Downstream Switch Port
- [0000F000 - 0000F03F] Intel(R) HD Graphics 4600
- [0000F040 - 0000F05F] Intel(R) 8 Series/C220 Series SMBus Controller - 8C22
- [0000F060 - 0000F07F] Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02
- [0000F080 - 0000F083] Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02
- [0000F090 - 0000F097] Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02
- [0000F0A0 - 0000F0A3] Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02
- [0000F0B0 - 0000F0B7] Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02
- [0000FFFF - 0000FFFF] Motherboard resources
- [0000FFFF - 0000FFFF] Motherboard resources
- [0000FFFF - 0000FFFF] Motherboard resources

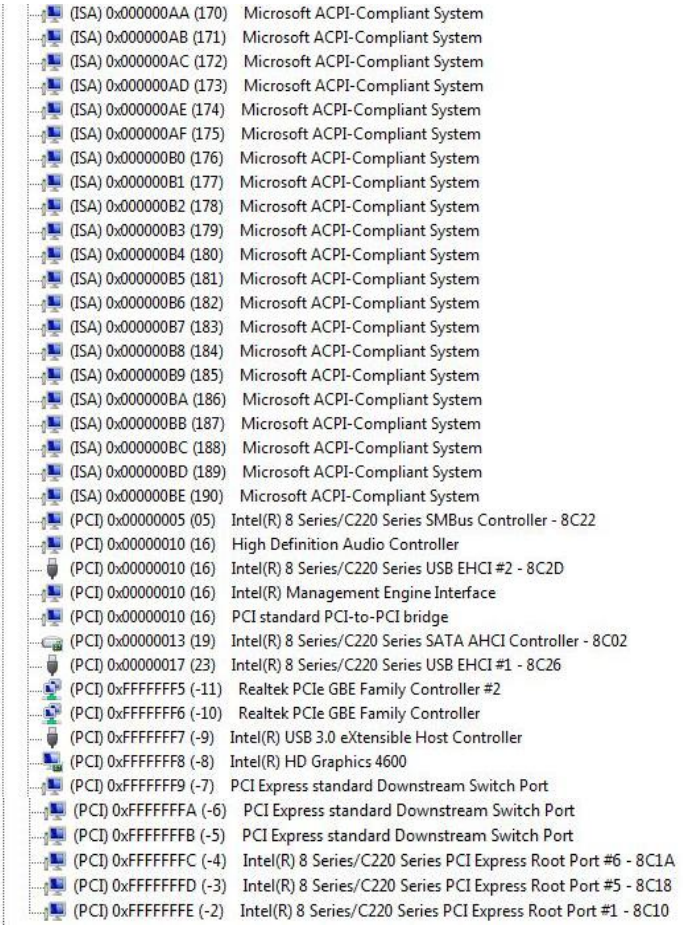
B.2 Memory Address Map



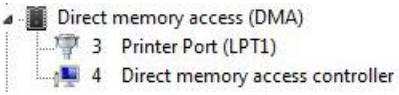
B.3 IRQ Mapping Chart

- Interrupt request (IRQ)
  - (ISA) 0x00000000 (00) System timer
  - (ISA) 0x00000003 (03) Communications Port (COM2)
  - (ISA) 0x00000004 (04) Communications Port (COM1)
  - (ISA) 0x00000008 (08) System CMOS/real time clock
  - (ISA) 0x0000000A (10) Communications Port (COM5)
  - (ISA) 0x0000000A (10) Communications Port (COM6)
  - (ISA) 0x0000000B (11) Communications Port (COM3)
  - (ISA) 0x0000000B (11) Communications Port (COM4)
  - (ISA) 0x0000000D (13) Numeric data processor
  - (ISA) 0x00000051 (81) Microsoft ACPI-Compliant System
  - (ISA) 0x00000052 (82) Microsoft ACPI-Compliant System
  - (ISA) 0x00000053 (83) Microsoft ACPI-Compliant System
  - (ISA) 0x00000054 (84) Microsoft ACPI-Compliant System
  - (ISA) 0x00000055 (85) Microsoft ACPI-Compliant System
  - (ISA) 0x00000056 (86) Microsoft ACPI-Compliant System
  - (ISA) 0x00000057 (87) Microsoft ACPI-Compliant System
  - (ISA) 0x00000058 (88) Microsoft ACPI-Compliant System
  - (ISA) 0x00000059 (89) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005A (90) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005B (91) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005C (92) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005D (93) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005E (94) Microsoft ACPI-Compliant System
  - (ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
  - (ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
  - (ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
  - (ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
  - (ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
  - (ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
  - (ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
  - (ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
  - (ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
  - (ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
  - (ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
  - (ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
  - (ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
  - (ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
  - (ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
  - (ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
  - (ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
  - (ISA) 0x00000075 (117) Microsoft ACPI-Compliant System

(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System



B.4 DMA Channel Assignments



Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	Front Panel Connector	JIH VEI Electronics	21B22564-XXS 10B-01G-6/3-V XX		N/A
CN2	Front Panel Connector	JIH VEI Electronics	21B22564-XXS 10B-01G-6/3-V XX		N/A
CN3	COM Port 6	PINREX	520-90-10GB00	Serial Port Cable	170110030L
CN4	COM Port 5	PINREX	520-90-10GB00	Serial Port Cable	170110030L
CN5	COM Port 4	PINREX	520-90-10GB00	Serial Port Cable	170110030L
CN6	COM Port 3	PINREX	520-90-10GB00	Serial Port Cable	170110030L
CN7	COM Port 2	PINREX	520-90-10GB00	Serial Port Cable	1701100305
CN8	COM Port 1	PINREX	520-90-10GB00	Serial Port Cable	1701260307
CN9	USB 2.0 Port 2/3	PINREX	220-97-05GB01	USB Cable	1709100201
CN12	DIO Port Connector	PINREX	220-97-05GB01		N/A
CN13	HDA Connector	PINREX	220-97-05GB01		N/A
CN14	PS/2 KB/MS Connector	CATCH	1130-010-08SA	KB/MS Cable	1709080207
CN15	Parallel Port Connector	CATCH	1147-000-26S	LPT Cable	1701260307
CN16	SATA Port 2	PINREX	770-83-07SB39	SATA Cable	1709070460

CN17	SATA Port 3	PINREX	770-83-07SB39	SATA Cable	1709070460
CN18	USB 3.0 Port 0	Foxconn	UEA3119C-4FB1-4F		N/A
CN19	SATA Port 0	PINREX	770-83-07SV29	SATA Cable	1709070460
CN20	SATA Port 1	PINREX	770-83-07SV29	SATA Cable	1709070460
CN21	USB 3.0 Port 1	Foxconn	UEA3119C-4FB1-4F		N/A
CN23	LAN 1 Connector	UDE	RB1-1A5BAK1A		N/A
CN25	LPC Connector	PINREX	710-73-12TW01		N/A
CN26	SPI Programming Connector	PINREX	232-92-04GBEM		N/A
CN27	DVI Connector	Astron	2560029-060-R		N/A
CN28	VGA Connector	Astron	HDLH-B15-CFHN1T-1-R		N/A
CN30	FAN2 Connector	PINREX	744-81-04TG20		N/A
CN31	FAN1 Connector	PINREX	744-81-04TG20		N/A
CN32	ATX +12V Power Connector	PINREX	740-81-04TV60		N/A
CN33	LAN 2 Connector	UDE	RB1-1A5BAK1A		N/A
DIMM1	DDR3 240PIN SKT	LOTES	AAA-DDR-151-K08		N/A
DIMM2	DDR3 240PIN SKT	LOTES	AAA-DDR-151-K08		N/A

Appendix

D

DIO

D.1 DIO

The related register for configuring DIO is list as follows:

7.1.2 Logic Device Number Register (LDN) — Index 07h

Bit	Name	R/W	Reset	Default	Description
7-0	LDN	R/W	LRESET#	00h	00h: Select FDC device configuration registers. 03h: Select Parallel Port device configuration registers. 04h: Select Hardware Monitor device configuration registers. 05h: Select KBC device configuration registers. 06h: Select GPIO device configuration registers. 07h: Select WDT device configuration registers. 0Ah: Select PME, ACPI and ERP device configuration registers. 10h: Select UART1 device configuration registers. 11h: Select UART2 device configuration registers. 12h: Select UART3 device configuration registers. 13h: Select UART4 device configuration registers. 14h: Select UART5 device configuration registers. 15h: Select UART6 device configuration registers. Otherwise: Reserved.

GPIO0 Output Enable Register — Index F0h

Bit	Name	R/W	Reset	Default	Description
7	GPIO07_OE	R/W	5VSB	0	0: GPIO07 is input. 1: GPIO07 is output.
6	GPIO06_OE	R/W	5VSB	0	0: GPIO06 is input. 1: GPIO06 is output.
5	GPIO05_OE	R/W	5VSB	0	0: GPIO05 is input. 1: GPIO05 is output.
4	GPIO04_OE	R/W	5VSB	0	0: GPIO04 is input. 1: GPIO04 is output.
3	GPIO03_OE	R/W	5VSB	0	0: GPIO03 is input. 1: GPIO03 is output.
2	GPIO02_OE	R/W	5VSB	0	0: GPIO02 is input. 1: GPIO02 is output.
1	GPIO01_OE	R/W	5VSB	0	0: GPIO01 is input. 1: GPIO01 is output.
0	GPIO00_OE	R/W	5VSB	0	0: GPIO00 is input. 1: GPIO00 is output.

GPIO0 Output Data Register — Index F1h (This byte could be also written by base address + 6)

Bit	Name	R/W	Reset	Default	Description
7	GPIO07_VAL	R/W	5VSB	0	GPIO07 supports pulse mode. When pulse mode is selected, write "1" to this bit will assert a pulse from GPIO07. Auto clear when pulse is finished. When level mode is selected, write 0/1 to this bit will set the level of GPIO07. 0: outputs 0 when in output mode. 1: outputs 1 when in output mode. GPIO07 will be tri-state if GPIO07_DRV is clear to "0".
6	GPIO06_VAL	R/W	5VSB	0	GPIO06 supports pulse mode. When pulse mode is selected, write "1" to this bit will assert a pulse from GPIO06. Auto clear when pulse is finished. When level mode is selected, write 0/1 to this bit will set the level of GPIO06. 0: outputs 0 when in output mode. 1: outputs 1 when in output mode. GPIO06 will be tri-state if GPIO06_DRV is clear to "0".
5	GPIO05_VAL	R/W	5VSB	0	GPIO05 supports pulse mode. When pulse mode is selected, write "1" to this bit will assert a pulse from GPIO05. Auto clear when pulse is finished. When level mode is selected, write 0/1 to this bit will set the level of GPIO05. 0: outputs 0 when in output mode. 1: outputs 1 when in output mode. GPIO05 will be tri-state if GPIO05_DRV is clear to "0".
4	GPIO04_VAL	R/W	5VSB	0	GPIO04 supports pulse mode. When pulse mode is selected, write "1" to this bit will assert a pulse from GPIO04. Auto clear when pulse is finished. When level mode is selected, write 0/1 to this bit will set the level of GPIO04. 0: outputs 0 when in output mode. 1: outputs 1 when in output mode. GPIO04 will be tri-state if GPIO04_DRV is clear to "0".1: GPIO04 outputs 1 when in output mode.
3	GPIO03_VAL	R/W	5VSB	1	0: GPIO03 outputs 0 when in output mode. 1: GPIO03 outputs 1 when in output mode.
2	GPIO02_VAL	R/W	5VSB	1	0: GPIO02 outputs 0 when in output mode. 1: GPIO02 outputs 1 when in output mode.
1	GPIO01_VAL	R/W	5VSB	1	0: GPIO01 outputs 0 when in output mode. 1: GPIO01 outputs 1 when in output mode.
0	GPIO00_VAL	R/W	5VSB	1	0: GPIO00 outputs 0 when in output mode. 1: GPIO00 outputs 1 when in output mode.

GPIO0 Drive Enable Register — Index F3h

Bit	Name	R/W	Reset	Default	Description
7	GPIO07_DRV_EN	R/W	5VSB	0	GPIO07 Drive Enable. 0: GPIO07 is open drain. 1: GPIO07 is push pull.
6	GPIO06_DRV_EN	R/W	5VSB	0	GPIO06 Drive Enable. 0: GPIO06 is open drain. 1: GPIO06 is push pull.

GPIO1 Output Enable Register — Index E0h

Bit	Name	R/W	Reset	Default	Description
7	GPIO17_OE	R/W	5VSB	0	0: GPIO17 is in input mode. 1: GPIO17 is in output mode.
6	GPIO16_OE	R/W	5VSB	0	0: GPIO16 is in input mode. 1: GPIO16 is in output mode.
5	GPIO15_OE	R/W	5VSB	0	0: GPIO15 is in input mode. 1: GPIO15 is in output mode.
4	GPIO14_OE	R/W	5VSB	0	0: GPIO14 is in input mode. 1: GPIO14 is in output mode.
3	GPIO13_OE	R/W	5VSB	0	0: GPIO13 is in input mode. 1: GPIO13 is in output mode.
2	GPIO12_OE	R/W	5VSB	0	0: GPIO12 is in input mode. 1: GPIO12 is in output mode.
1	GPIO11_OE	R/W	5VSB	0	0: GPIO11 is in input mode. 1: GPIO11 is in output mode.
0	GPIO10_OE	R/W	5VSB	0	0: GPIO10 is in input mode. 1: GPIO10 is in output mode.

GPIO1 Output Data Register — Index E1h (This byte could be also written by base address + 7)

Bit	Name	R/W	Reset	Default	Description
7	GPIO17_VAL	R/W	5VSB	1	0: GPIO17 outputs 0 when in output mode. 1: GPIO17 outputs1 when in output mode.
6	GPIO16_VAL	R/W	5VSB	1	0: GPIO16 outputs 0 when in output mode. 1: GPIO16 outputs1 when in output mode.
5	GPIO15_VAL	R/W	5VSB	1	0: GPIO15 outputs 0 when in output mode. 1: GPIO15 outputs 1 when in output mode.
4	GPIO14_VAL	R/W	5VSB	1	0: GPIO14 outputs 0 when in output mode. 1: GPIO14 outputs 1 when in output mode.
3	GPIO13_VAL	R/W	5VSB	1	0: GPIO13 outputs 0 when in output mode. 1: GPIO13 outputs 1 when in output mode.
2	GPIO12_VAL	R/W	5VSB	1	0: GPIO12 outputs 0 when in output mode. 1: GPIO12 outputs 1 when in output mode.
1	GPIO11_VAL	R/W	5VSB	1	0: GPIO11 outputs 0 when in output mode. 1: GPIO11 outputs 1 when in output mode.
0	GPIO10_VAL	R/W	5VSB	1	0: GPIO10 outputs 0 when in output mode. 1: GPIO10 outputs 1 when in output mode.

GPIO1 Pin Status Register — Index E2h (This byte could be also read by base address + 7)

Bit	Name	R/W	Reset	Default	Description
7	GPIO17_IN	R	-	-	The pin status of PECI/GPIO17.
6	GPIO16_IN	R	-	-	The pin status of BEEP/GPIO16/SDA.
5	GPIO15_IN	R	-	-	The pin status of WDTRST#/GPIO15.
4	GPIO14_IN	R	-	-	The pin status of GPIO14/AT_ATX_TRAP.
3	GPIO13_IN	R	-	-	The pin status of SDA/GPIO13/IRRX.
2	GPIO12_IN	R	-	-	The pin status of SCL/GPIO12/IRTX
1	GPIO11_IN	R	-	-	The pin status of GPIO11/LED_VCC.
0	GPIO10_IN	R	-	-	The pin status of GPIO10/LED_VSB.

GPIO2 Output Enable Register — Index D0h

Bit	Name	R/W	Reset	Default	Description
7	GPIO27_OE	R/W	5VSB	0	0: GPIO27 is in input mode. 1: GPIO27 is in output mode.
6	GPIO26_OE	R/W	5VSB	0	0: GPIO26 is in input mode. 1: GPIO26 is in output mode.
5	GPIO25_OE	R/W	5VSB	0	0: GPIO25 is in input mode. 1: GPIO25 is in output mode.
4	GPIO24_OE	R/W	5VSB	0	0: GPIO24 is in input mode. 1: GPIO24 is in output mode.
3	GPIO23_OE	R/W	5VSB	0	0: GPIO23 is in input mode. 1: GPIO23 is in output mode.
2	GPIO22_OE	R/W	5VSB	0	0: GPIO22 is in input mode. 1: GPIO22 is in output mode.
1	GPIO21_OE	R/W	5VSB	0	0: GPIO21 is in input mode. 1: GPIO21 is in output mode.
0	GPIO20_OE	R/W	5VSB	0	0: GPIO20 is in input mode. 1: GPIO20 is in output mode.

GPIO2 Output Data Register — Index D1h (This byte could be also written by base address + 8 if GPIO_DEC_RANGE is set to "1")

Bit	Name	R/W	Reset	Default	Description
7	GPIO27_VAL	R/W	5VSB	1	0: GPIO27 outputs 0 when in output mode. 1: GPIO27 outputs1 when in output mode.
6	GPIO26_VAL	R/W	5VSB	1	0: GPIO26 outputs 0 when in output mode. 1: GPIO26 outputs1 when in output mode.
5	GPIO25_VAL	R/W	5VSB	1	0: GPIO25 outputs 0 when in output mode. 1: GPIO25 outputs 1 when in output mode.
4	GPIO24_VAL	R/W	5VSB	1	0: GPIO24 outputs 0 when in output mode. 1: GPIO24 outputs 1 when in output mode.
3	GPIO23_VAL	R/W	5VSB	1	0: GPIO23 outputs 0 when in output mode. 1: GPIO23 outputs 1 when in output mode.
2	GPIO22_VAL	R/W	5VSB	1	0: GPIO22 outputs 0 when in output mode. 1: GPIO22 outputs 1 when in output mode.
1	GPIO21_VAL	R/W	5VSB	1	0: GPIO21 outputs 0 when in output mode. 1: GPIO21 outputs 1 when in output mode.
0	GPIO20_VAL	R/W	5VSB	1	0: GPIO20 outputs 0 when in output mode. 1: GPIO20 outputs 1 when in output mode.

GPIO2 Pin Status Register — Index D2h (This byte could be also read by base address + 8 if GPIO_DEC_RANGE is set to "1")

Bit	Name	R/W	Reset	Default	Description
7	GPIO27_IN	R	-	-	The pin status of RSMRST#/GPIO27.
6	GPIO26_IN	R	-	-	The pin status of PWOK/GPIO26.
5	GPIO25_IN	R	-	-	The pin status of PS_ON#/GPIO25.
4	GPIO24_IN	R	-	-	The pin status of S3#/GPIO24.
3	GPIO23_IN	R	-	-	The pin status of PWSOUT#/GPIO23.
2	GPIO22_IN	R	-	-	The pin status of PWSIN#/GPIO22.
1	GPIO21_IN	R	-	-	The pin status of ATXPG_IN#/GPIO21.
0	GPIO20_IN	R	-	-	The pin status of ALERT#/GPIO20/SCL.

The following is a sample code for DIO8 as input & DIO1 as output high (GPIO00, GPIO20)

```
Outportb(0x2E,0x87); //enter configuration
Outportb(0x2E,0x87);

Outportb(0x2E,0x07); //set LDN
Outportb(0x2F,0x06);

Outportb(0x2E,0xF0); //GPIO set 0 register
Outportb(0x2F,xxxxxxx0b); //Set GPIO00 (DIO8) as input mode

Outportb(0x2E,0xD0); //GPIO set 2 register
Outportb(0x2F,xxxxxxx1b); //Set GPIO20 (DIO1) as output mode

Outportb(0x2E,0xD1); //GPIO output data register
Outportb(0x2F,xxxxxxx1b); //DIO1 as High

Outportb(0x2E,0xAA); //exit configuration
```