



特种计算机

Industrial Computer

产品说明书

User Manual

104-1815CLD2NA

PC/104 主板带 VGA/LVDS/DVI/2LAN/4COM

PC/104 motherboard with VGA/LVDS/DVI
/2LAN/4COM

Version: C01

Legal Information

Warnings


Please pay attention to the tips within the manual so as to avoid personal injury or property losses. The tips for personal injury are indicated in warning triangles while the tips only related to property losses have no warning triangles. The warning tips are listed as follows with the hazardous scale from severe to slight.

 Danger

If handled carelessly, death or severe human injury will occur.

 Warning
--

If handled carelessly, death or severe human injury might occur.
--

 Caution
--

Warning triangle indicates that slight human injury might occur if handled carelessly.
--

Note

Unexpected result or status might occur, if not handled according to the tips.
--

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EVOC Product

Please pay attention to the following instructions:

 Warning
--

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Hotline: 4008809666

About this manual

Scope of the Manual


The manual is appropriate for EVOC 104-1815CLD2NA.

Convention

The term “the board” or “the Product” within the manual usually stands for EVOC 104-1815CLD2NA.

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle , whose existence is dependent upon the scale of the potential hazard.

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1. Product Introduction

1.1 Overview

104-1815CLD2NA is an embedded PC/104 structure industrial motherboard based on AMD embedded G-series processor + AMD A55E chipset. The motherboard features complete functions, multiple ports, wide temperature, high reliability and low power consumption. This product can be widely used in a wide range of embedded fields, such as traffic and transportation, vending machine, instrumentation and industrial sites, etc. Its main features are as follows:

- ◆ PC/104 bus single board structure;
- ◆ Supports AMD T16R 615M, T40E 1.0G, T56E 1.65G CPU;
- ◆ AMD G Series APU + AMD A55E;
- ◆ Onboard 1G/2G DDRIII memory;
- ◆ Supports VGA, LVDS, DVI/TTL (optional) dual display;
- ◆ Provides 2 x 100/1000Mbps Ethernet controller;
- ◆ Provides 2 x SATA interface and 1 x CF card slot;

In addition, the product provides 4 x USB port, 4 x COM port (one supports RS-232 and RS-485 optional), 1 x audio port, 1 x keyboard/mouse/reset multi-function port and Watchdog timer.

1.2 Mechanical Dimensions, Weight and Environment

- Dimensions: 116mm(L) x 97mm(W) x 23.5mm(H)(including heat sink)
- Net weight: 0.44Kg;
- Operating environment:

Temperature: 0°C ~ 60°C; extendable to: -40°C ~ 85°C

Humidity: 5% ~ 95% (non-condensing)

- Storage environment:

Temperature: $-45^{\circ}\text{C}\sim 85^{\circ}\text{C}$

Humidity: 5%~95% (non-condensing)

1.3 Typical Power Consumption

The typical power consumption is based on the following configuration in idle status.

CPU: AMD G-T16R Processor 615M

Memory: onboard DDR3 1GB Samsung K4B1G0846G-BCH9

- +5V@1.96A; +5%/-3% (standby);

CPU: AMD G-T65E Processor 1.65GHz

Memory: onboard DDR3 2GB Samsung K4B2G0846D-HCH9

- +5V@2.122A; +5%/-3% (standby);

1.4 Microprocessor

Supports AMD T16R(single core) 615MHz, T40E(dual core) 1.0GHz, T56E(dual core) 1.65GHz;

1.5 Chipset

AMD G Series APU + AMD A55E.

1.6 System Storage

Onboard 1G(when onboard T16R CPU is used) or 2G DDRIII memory (when onboard T40E or T56E CPU is used).

1.7 Display

- Supports VGA, LVDS, DVI and TFT LCD(optional) display;

- Supports combined dual display of VGA+LVDS, VGA+DVI or VGA+TTL, VGA+DVI;
- Supported resolutions and refresh rates are 800×600@60Hz, 1024×768@60Hz, 1920×1200@60Hz; that supported by LVDS is 1024×600@60Hz; that supported by DVI is 1920×1200@60Hz; that supported by LCD is 800×600@60Hz.

Note: Setup of display resolution: If WINDOWS users find that the display resolution cannot be modified, please enter into Display Properties—Settings—Advanced—Display Settings interfaces of the system, and remove the tick before “Hide Modes That This Monitor Cannot Display”, then press “Confirm” to finish the setting.

1.8 Network Function

This board integrates two 100/1000Mbps Ethernet controllers to provide users with a high-speed and stable network platform.

1.9 Audio

The product integrates one standard HDA sound chip, delivering excellent sound effect.

1.10 Power Feature

+5V single power supply.

1.11 Expansion Bus

1 x PCI-104 expansion bus slot and 1 x PC/104 expansion bus slot.

1.12 Watchdog

- 1~255 levels, programmable interrupt;
- 1~255 timeout event reset system;
- 1(second/minute) resolution down counter.

1.13 Operating System

- Supported operating systems: WINDOWS XP, WINDOWS 7, LINUX.

1.14 I/O ports

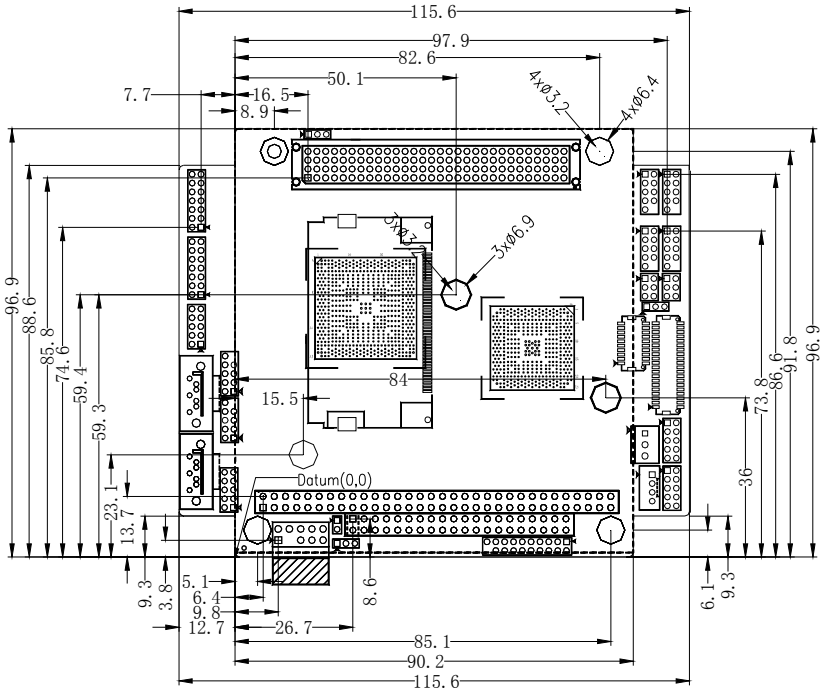
- 4 x COM port (one supports RS-232/RS-485 optional)
- 1 x HDA audio port
- 4 x USB2.0 port
- 1 x keyboard/mouse/buzzer/reset multifunction port

Tips: how to identify the alarms

1. Long “beep” indicates system memory error;
2. Short “beep” indicates to power on the computer.

2. Installation Instructions

2.1 Product Dimensions Drawing

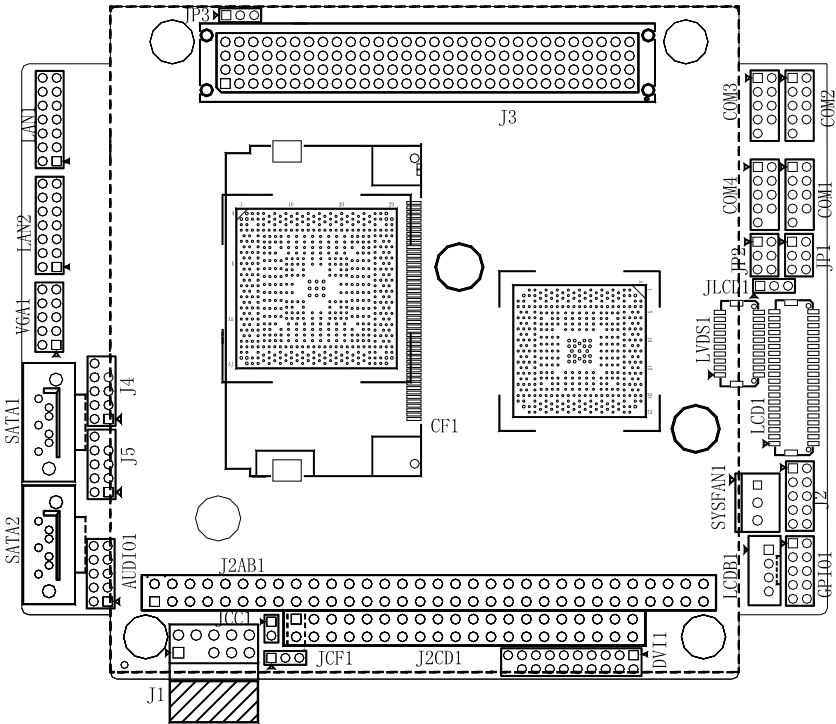


Unit: mm

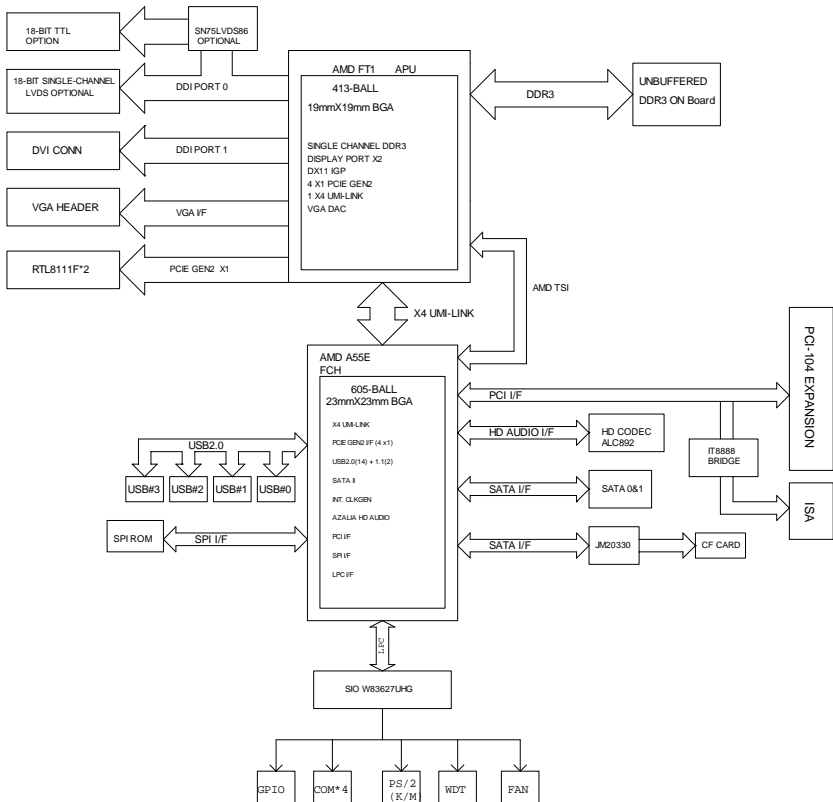
Warning!

Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation, etc); otherwise, the board may be damaged. It is recommended to use M3x6 GB9074.4-88 screws for this board.

2.2 Port Location



2.3 Structure Diagram




Tip: How to identify the first pin of the jumpers and connectors

1. Observe the letter beside the socket: the first pin is usually marked with “1” or bold lines or triangular symbols;
2. Observe the solder pad on the back: usually the square pad is the first pin.

2.4 Jumper Setting

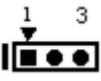
1. JCC1: Clear/Keep CMOS Setting (Pitch: 2.0mm)

CMOS is powered by the button battery onboard. Clearing CMOS will restore original settings (factory default). The steps are listed as follows: (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when booting the computer, load optimized defaults; (5) Save and exit. Please set as follows:

 JCC1	Setup	Function
	1-2 Open	Normal (Default)
	1-2 Short	Clear the contents of CMOS and all BIOS settings will restore to factory default values.


2. JLCD1: Select LCD Operating Voltage (Pitch: 2.0mm)

Different LCD screens have different voltages; the board provides two voltage options, +3.3V and +5V. Only when the selected LCD voltage is in accord with the LCD screen operating voltage in use, can the LCD screen operate normally. Please set as follows:


 JLCD1	Setup	Function
	1-2 Short	+3.3V(default)
	2-3 Short	+5V

3. JP1/JP2: Select RS-232/RS-485 Mode for COM3 (Pitch: 2.0mm)


COM3 supports RS-232/RS-485 modes; and the mode selection can be realized by setting JP1 and JP2.

 JP1/JP2	Pin	RS-232 (Default)	RS-485
	JP1	1-2	3-4
	JP2	1-3	3-5
	JP2	2-4	4-6

4. JP3: VIO Voltage Selection for PCI-104 expansion slot (pitch: 2.0mm)

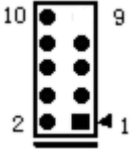
 JP3	Setup	Function
	1-2 Short	+3.3V(default)
	2-3 Short	+5V

5. JCF1: Voltage Selection for CF Card Slot (pitch: 2.0mm)

 JCF1	Setup	Function
	1-2 Short	+3.3V
	2-3 Short	+5V(default)

2.5 USB Port

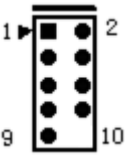
J4/J5 are 2×5Pin (pitch: 2.0) USB pin headers. Converter cable must be used to connect the port signal to standard socket. Their pin definitions are as follows:

 J4 (USB1/USB2) J5 (USB3/USB4)	Pin	Signal Name	Pin	Signal Name
	1	+5V	2	+5V
	3	USB1_Data-	4	USB2_Data-
	5	USB1_Data+	6	USB2_Data+
	7	GND	8	GND
	9	NA	10	GND_CHAS

2.6 COM Ports

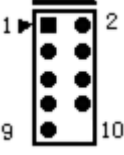
(1) COM3 port: RS-232 or RS-485

COM3 is a 2×5Pin (pitch: 2.0) COM port pin header. This COM port can select RS-232 or RS-485 mode by JP1 and JP2. Converter cables must be used to connect the port signals to standard sockets. Their pin definitions are as follows:

 <p>COM3</p>	Pin	RS-232/ RS-485 mode signal name	Pin	RS-232/ RS-485 mode signal name
	1	DCD#/DATA-	2	RXD/DATA+
	3	TXD/NC	4	DTR#/NC
	5	GND	6	DSR#/NC
	7	RTS#/NC	8	CTS#/NC
	9	RI#/NC	10	NA

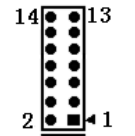
(2) COM1, COM2 and COM4 ports: RS-232

COM1, COM2 and COM4 ports are three 2×5Pin (pitch: 2.0) RS-232 pin headers. Converter cables must be used to connect the port signals to standard sockets. Their pin definitions are as follows:

 <p>COM1, 2, 4</p>	Pin	Signal Name	Pin	Signal Name
	1	DCD#	2	RXD
	3	TXD	4	DTR#
	5	GND	6	DSR#
	7	RTS#	8	CTS#
	9	RI#	10	NA

2.7 Network Port

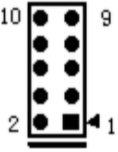
LAN1 and LAN2 are two 2×7Pin (pitch: 2.0) network port pin headers. The pin header ports are 100Mbps/1000 Mbps Ethernet ports on the motherboard. Converter cables must be used to connect the port signals to standard sockets. Their pin definitions are as follows:

 <p>LAN1/LAN2</p>	Pin	Signal Name	Pin	Signal Name
	1	MX0+	2	MX0-
	3	MX1+	4	MX1-
	5	MX2+	6	MX2-
	7	MX3+	8	MX3-
	9	GND	10	GND
	11	LINK1000-	12	LINK100-
	13	ACT LED+	14	ACT LED-

2.8. Display Ports

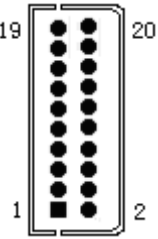
1. VGA Port

VGA1 is a 2×5Pin (pitch: 2.0) VGA pin header. Its pin definitions are as follows:

 <p>VGA1</p>	Pin	Signal Name	Pin	Signal Name
	1	VSYNC	2	HSYNC
	3	DDCDATA	4	Red
	5	DCCCLK	6	Green
	7	NC	8	Blue
	9	GND	10	GND

2. LVDS Port

LVDS1 is a single-channel 18bit LVDS port (pitch: 1.0 mm). Its pin definitions are as follows:

 <p>LVDS1</p>	Pin	Signal Name	Pin	Signal Name
	1	LVDS D0+	2	LVDS D0-
	3	GND	4	GND
	5	LVDS D1+	6	LVDS D1-
	7	GND	8	GND
	9	LVDS D2+	10	LVDS D2-
	11	GND	12	GND
	13	CLK+	14	CLK-
	15	GND	16	GND
	17	NC	18	NC
	19	VDD	20	VDD

3. DVI Port

DVI1 is a 2×10Pin (pitch: 2.0) DVI pin header. Its pin definitions are as follows:

 DVI-I	Pin	Signal	Pin	Signal Name
	1	DATA2-	2	DATA2+
	3	GND	4	GND
	5	DATA1-	6	DATA1+
	7	GND	8	GND
	9	DATA0-	10	DATA0+
	11	GND	12	GND
	13	CLK+	14	CLK-
	15	+5V	16	HPDET
	17	DDCDATA	18	DDCCLK
	19	GND	20	NA

4. TTL Port (optional)

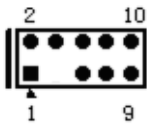
LCD1 is a single-channel 6bit TTL LCD display port (pitch: 1.0 mm). Its pin definitions are as follows:

 LCD1	Pin	Signal Name	Pin	Signal Name
	1	VDD	2	VDD
	3	GND	4	ENAVEE
	5	GND	6	GND
	7	NC	8	NC
	9	B1	10	B0
	11	B3	12	B2
	13	B5	14	B4
	15	NC	16	NC
	17	G1	18	G0
	19	G3	20	G2
	21	G5	22	G4
	23	NC	24	NC
	25	R1	26	R0
	27	R3	28	R2
	29	R5	30	R4
	31	GND	32	GND
	33	VSYNC	34	CLOCK
	35	HSYNC	36	LCD_EN
37	BKL_EN	38	NC	
39	GND	40	NC	

Note: If VGA and LCD dual display is used, please set the refresh rate of display monitor as 60Hz in the system.

2.9 Power Connector

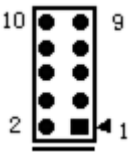
J1 is a 2×5Pin (pitch: 2.54 mm) power supply pin header. Converter cable must be used to connect the port signal to standard socket. Its pin definitions are as follows:

 <p>J1</p>	Pin	Signal Name	Pin	Signal
	1	GND	2	+5V
	3	NA	4	+12V
	5	NC	6	-12V
	7	GND	8	+5V
	9	GND	10	+5V

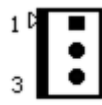
Note: +5V is operating power supply for the motherboard; Please make sure the operating voltage input to the motherboard is within the range of 5V±5%. +12V, -12V, -5V are power supplies for external bus expansion devices or LCD backlight, and users can choose whether to connect them according to the actual situation.

2.10 Audio Ports

This board provides one group of audio ports (pitch: 2.0mm). LINE_OUT can be connected to earphone or speaker with appropriate power. LINE_IN can be connected to audio signal input; MIC_IN can be connected to microphone for audio input. Their pin definitions are as follows:

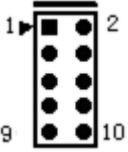
 <p>AUDIO1</p>	Pin	Signal Name	Pin	Signal Name
	1	LINE_OUT_	2	LINE_OUT_
	3	GND_AUDI	4	GND_AUDI
	5	LINE_IN_R	6	LINE_IN_L
	7	GND_AUDI	8	GND_AUDI
	9	MIC1_L	10	MIC1_R

2.11 Fan Connector

 <p>SYSFAN1 (pitch: 2.54mm)</p>	Pin	Signal Name
	1	GND
	2	+5V
	3	FAN_IO


2.12 Multi-function Port

J2 is a 2×5Pin(pitch: 2.0mm) pin header, and is a multifunction port used to connect keyboard, mouse, buzzer and reset. The multifunction port cables configured with the single board computer must be used to connect each port. Its pin definitions are as follows:

 <p>J2</p>	Pin	Signal Name	Pin	Signal Name
	1	SPEAK-	2	+5V
	3	RESET	4	GND
	5	Keyboard Data	6	Keyboard Clock
	7	GND	8	Mouse Clock
	9	+5V	10	Mouse Data

2.13 LCD Backlight Control Port

This board provides one 1×4Pin wafer LCD backlight control port (pitch: 2.0mm). Its pin definitions are as follows:

 <p>LADB1</p>	Pin	Signal Name
	1	VCC_LADBKLT
	2	LCD_BKLTCTL
	3	LCD_BKLTEN
	4	GND

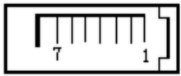
Note: VCC_LADBKLT---+12V backlight power supply (the current should be limited below 1A);

LCD_BKLTCTL---backlight control (this signal is directly output by CPU, and is PWM signal; voltage amplitude 0V—3.3V, duty cycle is within 0-100%);

LCD_BKLTEN --- backlight enabling signal, active high. (the signal of this board is directly output by CPU, CMOS output; voltage amplitude 0V-3.3V).

2.14 SATA Interface

This motherboard provides two SATA interfaces.

 <p>SATA1, SATA2</p>	Pin	Signal Name
	1	GND
	2	TX+
	3	TX-
	4	GND
	5	RX-
	6	RX+
	7	GND

2.15 Hot-swap of SATA Hard Drive

Notes for hot-swap of SATA hard drive:

1. The hard drive shall support SATA 2.0 and use 15-pin SATA hard drive power connector.
2. The driver of chipset shall support the hot-swap of SATA hard drive.
3. Hot-swap of SATA hard drive where the operating system is located is forbidden when system is powered-on.



Please carry out hot plugging as follows. Improper operation may destroy the hard drive or result in data loss.

SATA hard drive hot plug steps:



Step 1: Please plug the 1x4-pin SATA power connector (white) into the 1x4-pin power cable of power adapter.



Step 2: Please connect the SATA data cable to the SATA interface on the motherboard.



Step 3: Please connect the 15-pin SATA power connector (black) to the SATA hard drive.



Step 4: Please connect the SATA data cable to the SATA hard disk.

Hot unplug steps:

Step 1: Uninstall the hard drive from the device manager.

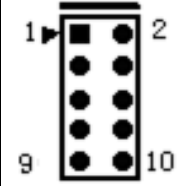


Step 2: Unplug the data cable from the SATA hard drive.



Step 3: Unplug the SATA 15-pin power connector (black) from the SATA hard drive.

2.16 GPIO Port

 <p>GPIO1 (pitch: 2.0mm)</p>	Pin	Signal Name	Pin	Signal Name
	1	GPIO1	2	GPIO5
	3	GPIO2	4	GPIO6
	5	GPIO3	6	GPIO7
	7	GPIO4	8	GPIO8
	9	GND	10	NC

Note: By the factory default, pin 1, 3, 5 and 7 are for GPIO input while pin 2, 4, 6 and 8 are for GPIO output. The factory default state is high level and the voltage range for input/output signal is 0-5V.

2.17 CF Card

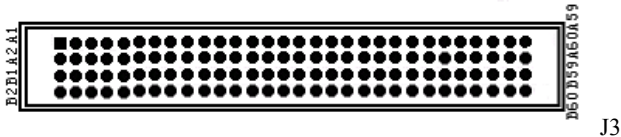
Compact Flash card is a rapid storage card, which is small in size and easy to use. Its storage capacity varies with different cards, like 128M, 256M, etc. CF card can only be inserted in one direction (on the back of the board, and the sign is CF1).

Pin	Signal Name	Pin	Signal Name
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ

13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

2.18 PCI-104 Expansion Slot

J3 is the PCI-104 expansion slot, which supports up to three PCI devices. Its pin definitions are as follows:

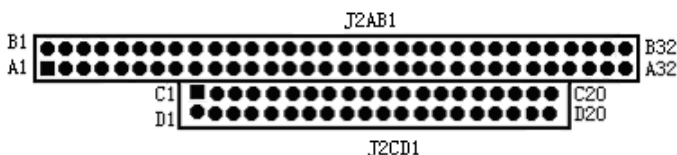


Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	GND	B1	+5V_SB	C1	+5V	D1	AD00
A2	VIO0	B2	AD02	C2	AD01	D2	+5V
A3	AD05	B3	GND	C3	AD04	D3	AD03
A4	C/BE0-	B4	AD07	C4	GND	D4	AD06
A5	GND	B5	AD09	C5	AD08	D5	GND
A6	AD11	B6	VIO1	C6	AD10	D6	M66EN
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	C/BE1-	C8	AD15	D8	+3.3V
A9	SERR-	B9	GND	C9	PSOEN-	D9	PAR
A10	GND	B10	PERR-	C10	+3.3V	D1	PME-
A11	STOP-	B11	+3.3V	C11	LOCK-	D1	GND

A12	+3.3V	B12	TRDY-	C12	GND	D1	DEVSEL-
A13	FRAME-	B13	GND	C13	IRDY-	D1	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D1	C/BE2-
A15	AD18	B15	+3.3V	C15	AD17	D1	GND
A16	AD21	B16	AD20	C16	GND	D1	AD19
A17	+3.3V	B17	AD23	C17	AD22	D1	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D1	IDSEL2
A19	AD24	B19	C/BE3-	C19	VIO3	D1	IDSEL3
A20	GND	B20	AD26	C20	AD25	D2	GND
A21	AD29	B21	+5V	C21	AD28	D2	AD27
A22	+5V	B22	AD30	C22	GND	D2	AD31
A23	REQ0-	B23	GND	C23	REQ1-	D2	VIO4
A24	GND	B24	REQ2-	C24	+5V	D2	GNT0-
A25	GNT1-	B25	VIO2	C25	GNT2-	D2	GND
A26	+5V	B26	CLK0	C26	GND	D2	CLK1
A27	CLK2	B27	+5V	C27	CLK3	D2	GND
A28	GND	B28	INTD-	C28	+5V	D2	RST-
A29	+12V	B29	INTA-	C29	INTB-	D2	INTC-
A30	-12V	B30	REQ3-	C30	GNT3-	D3	GND

2.19 PC/104 Slot

This motherboard provides one PC/104 slot (J2AB, J2CD). Its pin definitions are as follows:



Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHCK#	B1	GND	C1	GND	D1	GND
A2	SD7	B2	RESET	C2	SBHE#	D2	MEMCS16
A3	SD6	B3	+5V	C3	LA23	D3	IOCS16#
A4	SD5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	SD4	B5	-5V	C5	LA21	D5	IRQ11
A6	SD3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	SD2	B7	-12V	C7	LA19	D7	IRQ15
A8	SD1	B8	SRDY#	C8	LA18	D8	IRQ14
A9	SD0	B9	+12V	C9	LA17	D9	DACK0#



A10	IOCHRDY	B10	KEY	C10	MEMR#	D10	DRQ0
A11	AEN	B11	SMEMW#	C11	MEMW#	D11	DACK5#
A12	SA19	B12	SMEMR#	C12	SD8	D12	DRQ5
A13	SA18	B13	IOW#	C13	SD9	D13	DACK6#
A14	SA17	B14	IOR#	C14	SD10	D14	DRQ6
A15	SA16	B15	DACK3#	C15	SD11	D15	DACK7#
A16	SA15	B16	DRQ3	C16	SD12	D16	DRQ7
A17	SA14	B17	DACK1#	C17	SD13	D17	+5V
A18	SA13	B18	DRQ1	C18	SD14	D18	MASTER#
A19	SA12	B19	REFRESH#	C19	SD15	D19	GND
A20	SA11	B20	BCLK	C20	KEY	D20	GND
A21	SA10	B21	IRQ7				
A22	SA9	B22	IRQ6				
A23	SA8	B23	IRQ5				
A24	SA7	B24	IRQ4				
A25	SA6	B25	IRQ3				
A26	SA5	B26	DACK2#				
A27	SA4	B27	TC				
A28	SA3	B28	BALE				
A29	SA2	B29	+5V				
A30	SA1	B30	OSC				
A31	SA0	B31	GND				
A32	GND	B32	GND				

3. BIOS Setup

3.1 UEFI Overview

UEFI (Unified Extensible Firmware Interface) is the latest computer firmware to replace traditional BIOS. UEFI is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and controlling interface for the upper level software system, guide operating system and so on. UEFI provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the UEFI correctly could enable the system operating stably and reliably; it could also improve the overall performance of the system at the same time. Inadequate even incorrect UEFI parameter setting will decrease the system operating capability and make the system operating unstably even unable to operate normally.

3.2 UEFI Parameter Setup

Prompt message for UEFI setting may appear once powering on the system. At that time (invalid at other time), press the key specified in the prompt message (usually or <ESC>) to enter UEFI setting.

All the setup values modified by UEFI (excluding data and time) are saved in the flash storage in system; the contents will not be lost even if powered down or remove the battery of the board. The data and time are saved in CMOS storage, which is powered by battery; unless clearing CMOS is executed, its contents would not be lost even if powered off.

Note! UEFI setting will influence the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of UEFI to restore the system. Our company is constantly researching and updating UEFI, its setup interface may be a bit different. The figure below is for reference only; it may be different from your UEFI setting in use.

3.3 Basic Function Setting for UEFI

After starting SETUP program, the main interface of Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. will appear:

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc. Copyright		
Main Advanced Chipset Boot Security Save & Exit		
Motherboard Information Project Name 104-1815CLD2NA BIOS Name Q9169000 BIOS Version A00 Build Date 11/15/2012 14:24:10 Memory Information Total Memory 1008 MB (DDR3) System Date [Mon 11/01/2009] System Time [00:47:55] Access Level Administrator	Set the Date. Use‘Tab’ to switch between Date elements. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit	
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.		

◆ **Main**

➤ **System Date**

Choose this option and set the current date by < + > / < - >, which is displayed in format of month/date/year. Reasonable range for each option is: Month (1-12), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.).

➤ **System Time**

Choose this option and set the current time by < + > / < - >, which is displayed in format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59).

◆ **Advanced**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
<p>WARNING: Setting wrong values in below sections may cause system to malfunction !</p> <ul style="list-style-type: none"> ▶ CPU Configuration ▶ IDE Configuration ▶ USB Configuration ▶ Super IO Configuration ▶ H/W Monitor ▶ HDD Latency Time 	<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit</p>
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

➤ **CPU Configuration**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
<p>CPU Configuration</p> <p>Module Version:4.6.3.7 OntarioPI 030 AGESA Version:1.2.0.0</p> <p>▶Node 0 Information</p>	<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit</p>
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Socket0: AMD G-T16R Processor Single Core Running @622 MHz 962 mV Max Speed:615 MHZ Intended Speed:615MHZ Min Speed:615MHZ Microcode Patch Level:500010d -----Cache per Core----- L1 Instruction Cache: 32 KB/2-way L1 Data Cache:32 KB/2-way L2 Cache:512 KB/16-way No L3 Cache Present	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

Display the relevant information of CPU. Note: the corresponding information of the CPU (e.g. Socket, Speed) is related to the CPU installed in the platform; different series of CPUs will display different information.

➤ IDE Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.									
Advanced									
IDE Configuration <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">SATA Port0</td> <td style="text-align: center;">Not Present</td> </tr> <tr> <td>SATA Port1</td> <td style="text-align: center;">Not Present</td> </tr> <tr> <td>SATA Port2</td> <td style="text-align: center;">Not Present</td> </tr> <tr> <td>SATA Port3</td> <td style="text-align: center;">Not Present</td> </tr> </table>	SATA Port0	Not Present	SATA Port1	Not Present	SATA Port2	Not Present	SATA Port3	Not Present	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
SATA Port0	Not Present								
SATA Port1	Not Present								
SATA Port2	Not Present								
SATA Port3	Not Present								
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.									

SATA Port0~3 dynamically detect whether there is a SATA device connected to the motherboard. If a device is connected to a SATA port, the model of the SATA device will be displayed. Otherwise, Not Present is displayed.

➤ **USB Configuration**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
<p>USB Configuration</p> <p>USB Devices: 1 Keyboard, 1 Mouse, 2 Hubs</p> <p>Legacy USB Support [Enabled]</p>	<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit</p>
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

Legacy USB Support

This option is used to support legacy USB devices (keyboard, mouse, storage device, etc). When it is set to Enabled, the USB devices can be used in the OS that does not support USB, such as DOS. When it is set to Disabled, the legacy devices cannot be used in the OS that does not support USB.

Note: USB can be used in EFI application, such as in Shell.

➤ **Super IO Configuration**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
<p>Super IO Configuration</p> <ul style="list-style-type: none"> ▶ Serial Port 0 Configuration ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration ▶ Serial Port 3 Configuration 	<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit</p>
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

1. Serial Port Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
Serial Port 0~3 Configuration Serial Port [Enabled] Device Settings IO=3F8h; IRQ=4;	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

* Serial Port0~3

This option is used to enabled or disable the current serial port.

* Device Settings

This option is used to display the current resource configuration of the serial port.

➤ H/W Monitor

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Advanced	
PC Health Status SYS Thermistor Temp : +26 C SysFan Speed : N/A Vcore : +1.152 V VIN2(V3.3) : +3.328 V VIN0(V5.0) : +5.058 V VBAT : +3.296 V	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

Display the currently detected hardware monitoring information, such as voltage, temperature, etc.

1. SYS Thermistor Temp

Current system temperature, monitored by the thermal resistor on motherboard.

2. SYSFan Speed

SysFan Speed monitor.

3. Vcore

CPU core voltage.

4.V3.3/ V5.0

Turn on/off the power to output voltage.

5.VBAT

CMOS battery voltage.

➤ **HDD Latency Time**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
HDD Latency Time	[Disabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.		

HDD Latency Time

To set HDD detection latency time. When a big HDD is used, this option can make adjustment to suit the actual needs, so as to ensure normal operation of the HDD.

◆ **Chipset**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
<ul style="list-style-type: none"> ▶ North Bridge LVDS Config Select ▶ South Bridge 	→←-: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

➤ **North Bridge LVDS Config Select**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Chipset	
North Bridge LVDS Config Select DP0 Output Mode [LVDS] DP1 Output Mode [Single-Link DVI-D] LVDS Panel Config Select [LVDS Option1 800*600] EDID Panel Option [Enabled]	→←-: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.00.1201. Copyright (C) 2008,American Megatrends, Inc.	

1. DP0 Output Mode

To set DP0 output mode.

2. DP1 Output Mode

To set DP1 output mode.

3. LVDS Panel Config Select

This option is used to select resolution of Flat Panel.

4. EDID Panel Option

To select whether EDID is supported.

➤ **South Bridge**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Chipset	
<ul style="list-style-type: none"> ▶ SB SATA Configuration ▶ SB USB Configuration ▶ SB HD Azalia Configuration ▶ SB HardWare Monitor 	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

1. SB SATA Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Chipset	
SB Sata Configuration OnChip Sata Channel [Enabled] OnChip Sata Type [Native IDE]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

* **OnChip SATA Channel**

This option is used to enable or disable SATA controller.

* **ONChip Sata Type**

To configure SATA type.

2. SB USB Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
SB USB Configuration		→←: Select Screen
		↑↓: Select Item
		Enter: Select
OHCI HC (bus0 device18 fun0)	[Enabled]	+/-: Change Opt
USB Port 0	[Enabled]	F1: General Help
USB Port 1	[Enabled]	F2: Previous Values
USB Port 2	[Enabled]	F3: Optimized Defaults
USB Port 3	[Enabled]	F4: Save&Exit
USB Port 4	[Enabled]	ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.		

* OHCI HC (bus0 device18 fun0)

This option is used to enable or disable in the controller mode.

* USB Port 0~4

This option is used to enable or disable USB Port0~4.

3. SB HD Azalia Configuration

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
SB HD Azalia Configuration		→←: Select Screen
		↑↓: Select Item
		Enter: Select
HD Audio Azalia Device	[Enabled]	+/-: Change Opt
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save&Exit
		ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.		

* HD Audio Azalia Device

This option is used to enable or disable audio card controller.

4. SB Hardware Monitor

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Chipset	
SB Hardware Monitor CPU Temperature : +26 C CPUFAN1 Speed : N/A	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

*** CPU Temperature**

To display detected CPU temperature.

*** CPUFAN1 Speed**

To display CPU fan speed.

◆ Boot

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] Fast Boot [Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit
Boot Option Priorities Boot Option #1 [Built-in EFI Shell]	
Hard Drive BBS Priorities ► CSM parameters	
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.	

- **Quiet Boot**
Boot mode selection switch, used to enable or disable Quiet Boot function.
- **FAST Boot**
Switch for fast boot.
- **Boot Option Priorities**
This option is used to configure the system booting priorities. #1 represents the highest priorities while #n represents the lowest priorities.
- **Hard Drive BBS Priorities**
This option is used to configure the priorities of the legacy devices in BBS. #1 represents the highest priorities while #n represents the lowest priorities.
- **► CSM parameters**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
Launch CSM	[Enabled]	→←: Select Screen
Boot option filter	[UEFI and Legacy]	↑↓: Select Item
Launch PXE OproM policy	[UEFI only]	Enter: Select
Launch storage OproM policy	[UEFI only]	+/-: Change Opt
Launch Video OproM policy	[Legacy only]	F1: General Help
Other PCI device Rom priority	[UEFI only]	F2: Previous Values
		F3: Optimized Defaults
		F4: Save&Exit
		ESC: Exit
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.		

- **Launch CSM**
To enable or disable CSM function.
- **Boot option filter**
To select boot option for boot device.
- **Launch PXE OproM policy**
To select boot option for PXE Option ROM.
- **Launch storage OproM policy**

To select boot option for storage device Option ROM.

➤ **Launch Video Oprom policy**

To select boot option for video device Option ROM.

➤ **Other PCI device Rom priority**

To select boot option for other PCI device Option ROM.

◆ **Security**

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.					
Main Advanced Chipset Boot Security Save & Exit					
<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The Password length must be in the following range:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Minimum length</td> <td style="text-align: right;">3</td> </tr> <tr> <td>Maximum length</td> <td style="text-align: right;">20</td> </tr> </table> <p>Administrator Password User Password</p>	Minimum length	3	Maximum length	20	<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit</p>
Minimum length	3				
Maximum length	20				
Version 2.15.1234 Copyright (C) 2012 American Megatrends, Inc.					

➤ **Setup Administrator Password**

This option is used to set administrator password.

➤ **User Password**

This option is used to set user password.

Note: If ONLY the Administrator's password is set, then this is only asked for when entering Setup;

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
Save Changes and Exit	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save&Exit ESC: Exit	
Discard Changes and Exit		
Save Changes and Reset		
Discard Changes and Reset		
Save Options		
Save Changes		
Discard Changes		
Restore Defaults		
Save as User Defaults		
Restore User Defaults		
Boot Override		
Version 1.28.1119. Copyright (C) 2010,American Megatrends, Inc.		

➤ **Save Changes and Exit**

The option is used to save changes and exit Setup program. If the changes only take effect after reboot, the system will be automatically rebooted.

➤ **Discard Changes and Exit**

This option is used to discard changes and exit Setup program.

➤ **Save Changes and Reset**

This option is used to save changes and reset.

➤ **Discard Changes and Reset**

This option is used to discard changes and reset.

➤ **Save Changes**

To save changes.

➤ **Discard Changes**

To discard changes.

➤ **Restore Defaults**

To restore defaults.

➤ **Save as User Defaults**

To save as user defaults.

➤ **Restore User Defaults**

To restore user defaults.

➤ **Boot Override**

This option lists all the boot options, and users can select one of them and press <Enter> to load the option.

3.4 System Resource Managed by UEFI under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

◆ **DMA**

Level	Function
DMA0	Unassigned
DMA1	Unassigned
DMA2	Unassigned
DMA3	Unassigned
DMA4	Used for DMAC cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

◆ APIC

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function.

◆ IO Port Address

Only 16 IO address lines are designed for X86, from 0 ~ 0FFFFh; there is 64K for the system I/O address space. In traditional ISA connector, only the foregoing 1024 (0000 ~ 03FFh) are adopted while the ports above 0400h are adopted by PCI and EISA connectors. Each peripheral will occupy portion of the space. The table below shows the I/O connectors used in X86 platform.

Address	Device Description
000h - 000Fh	DMA Controller#1
010h - 001Fh	Motherboard resource
020h - 021h	Programmable Interrupt Controller
022h - 03Fh	Motherboard resource
040h - 043h	System Timer
44h - 5fh	Motherboard resource
61h	System speaker
62h-63h	Motherboard resource
65h-6fh	Motherboard resource
070h - 071h	System CMOS/Real Time Clock
72h-EFh	Motherboard resource
0F0h – 0FFh	Numeric data processor
274h-277h	ISAPNP Read Data Port
279h	ISAPNP Read Data Port
2E8h – 2EFh	COM4
2F8h – 2FFh	COM2
3B0h – 3BBh	AMD Radeon HD 6250 Graphics
3C0h – 3DFh	AMD Radeon HD 6250 Graphics

3E8h – 3EFh	COM3
3F8h – 3FFh	COM1
40bh - 91fh	Motherboard resource
A79h	ISAPNP Read Data Port
B20h- CDfh	Motherboard resource
D00h – FFFFh	PCI Bus

◆ **IRQ Assignment Table**

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be assigned to other devices. ISA device requests exclusive use of its interrupt. Only the plug and play ISA devices can be assigned by the UEFI or the OS. And several PCI devices share one interrupt, which is assigned by UEFI or OS. Interrupt assignment of some devices of X86 platform is shown in the table below, but it does not show the interrupt source occupied by the PCI devices.

Level	Function
IRQ0	System Timer
IRQ1	Standard 101/102 Key or Microsoft Keyboard
IRQ2	Reserved
IRQ3	COM 2
IRQ4	COM 1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	System CMOS/Real Time Clock
IRQ9	Microsoft ACPI-Compliant System
IRQ10	COM4
IRQ11	COM3
IRQ12	PS/2 mouse
IRQ13	Numeric data processor
IRQ14	Reserved
IRQ15	Reserved

4. Installing the Drivers

Regarding the driver program of this product, please refer to the enclosed CD.

5. Appendix

5.1 BPI Overview

EVOC BPI (BIOS Programming Interface) is a cross-platform, easy-to-maintain software interface specification, which supports access to hardware under the Protected Mode of the operating system. The function of the product is to provide a unified standard interface for the application software or driver; therefore, when the hardware of the motherboard is upgraded, there is no need to modify the application software or driver and the former software can operate on the new platform normally. It has greatly sped up the product development and reduced the maintenance cost. Currently, BPI supports the configuration of WDT and GPIO as well as H/W monitor function. As for the test program and function library, please refer to the relevant documents in the enclosed CD.

Features of the BPI include:

1. Platform Irrelevant

The software developed by BPI function library can operate on a new platform, supporting BPI function, normally without making any modification.

2. Security and High Reliability

The BPI function library accessing the hardware is programmed by the motherboard developer and is strictly tested; therefore, it can avoid system malfunction caused by improper operation of the system hardware.

3. Flexible Configuration

Take GPIO configuration as an example, users may conveniently configure an arbitrary GPIO function by BPI function library or test program.

4. Easy Maintenance

Traditional WDT and GPIO programming are closely related to the hardware with complicated test and debug process and software of different platforms; however, the software developed by BPI only requires one set of the maintenance software.

5. Low Cost

Developing the applications by BPI will not result in additional hardware and software cost, but it will reduce the development difficulty, development cycle and time-to-market for the system integrator.

5.2 Troubleshooting and Solutions

No.	Phenomenon	Troubleshooting and Solution
1	BIOS setting cannot be saved	<p>Analysis: it could be the problem of the CMOS battery.</p> <p>Solution: measure the CMOS battery with a multi-meter; if the voltage is insufficient, replace the battery; re-set the BIOS and save again.</p>
2	The computer can only be powered-on occasionally	<p>Analysis: it may be caused by poor connection. Remove the power plug from power socket on motherboard, you may find that certain pin of the motherboard power has been collapsed to one side after some forceful insertion.</p> <p>Solution: power off the computer and remove the power plug; erect the bended power pin with tweezers and re-insert in the power socket. Reboot the computer and test for several times until the problem no longer exits.</p>
3	When connecting with a USB flash drive, the system prompts that a high-speed device has been connected with a low-speed connector.	<p>Analysis: A USB flash drive is a high-speed USB2.0; when connecting with the computer, it prompts that a high-speed device has been connected with a low-speed connector, which indicates that the connector on motherboard is regarded as a USB1.1 port.</p> <p>Solution: enable the USB high-speed transmission mode on the motherboard. Different motherboards may have different settings. Change the FULLSPEED option to HISPEED in USB device option.</p>
4	The screen has no display after replacing with a new memory and cannot enter system; even when	<p>Analysis: it could result from improper operation when inserting or removing the memory and cause abnormal operation of the components on the motherboard. Focus on the circuit related to the memory on the motherboard.</p>

	<p>the former memory is re-installed, the system cannot be booted as well.</p>	<p>Solution: check the hardware such as memory, video card first; if it shows that the hardware are all OK, then check the circuit around the memory slot on motherboard carefully; you may find that the two pins connected with the gold finger in the first memory slot are shorted while the second memory slot is normal, then you may know that there is short circuit in the first memory slot. Remove the two pins to their original location with tweezers carefully, insert the memory, reboot the system and the system will be booted smoothly.</p>
<p>5</p>	<p>The system cannot be booted after replacing a CD-ROM.</p>	<p>Analysis: the data cable of the hard disk may get knocked when installing the CD-ROM, which leads to poor connection of the hard disk data cable, or the master and slave jumpers on hard disk and CD-ROM are wrongly set.</p> <p>Solution: check the data cable of the hard disk and the IDE connectors on hard disk and motherboard first; if there are no problems, then check the master and slave jumper setting. You may find that the hard disk and CD-ROM are connected with different data cables while their jumpers are all set to master; thus, the hard disk cannot be booted. Set the CD-ROM jumper to slave and then re-install it.</p>
<p>6</p>	<p>No PCI card can be detected after entering the system.</p>	<p>Analysis: make sure the PCI card functions normally; re-insert the PCI card or insert it into another PCI slot to see whether it is normal; find out the power type in use (AT or ATX); find out users' requirement for the PCI card voltage.</p> <p>Solution: if the PCI card functions abnormally,</p>

		<p>replace it with a new one; if it functions normally when re-inserted or inserted in another PCI slot, then there is something wrong between the PCI card and the slot. If AT power is adopted and the PCI card requires 3.3V voltage, then the AT power shall be replaced with ATX power because AT power cannot provide 3.3V voltage. (Suggestion: when purchasing power supplies, please check whether the PCI card in use requires 3.3V voltage or not).</p>
7	<p>No peripheral devices can be detected.</p>	<p>Analysis: devices are not connected; no drivers are loaded; devices are broken.</p> <p>Solution: check whether the cable between the device and the motherboard is normal; if it is normal, replace it with a new cable to make sure the connection is OK. Re-install the device driver and check whether it can be recognized; check whether the device is normal; if the device is normal, then check whether the device is compatible with the motherboard.</p>