EP821 Series

Intel® Pentium® M All-In-One

EPIC SBC

With DualView, SATA and PCI-104 Expansion

User's Manual

Disclaimers

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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MEMO

Chapter 1
Introduction

The All-In-One EPIC board **EP821** Series supports Socket 478 for Intel® Pentium® M/Celeron® M processors with FSB400/533MHz, LV Intel® Pentium® M 1.4GHz and ULV Celeron® M 1GHz. The board integrates Intel® 915GM and ICH6M chipsets that support LVDS + CRT, dual Gigabit/Fast Ethernet and AC'97 Codec Audio all in one single board. Additionally, it provides you with unique embedded features, such as 4 serial ports (3 x RS-232 and 1 x RS-232/422/485), 4 USB2.0 ports for high speed peripherals, PCI-104 expansion, 1 SATA port. It can achieve the best stability and reliability that makes your system perform the most endurable operation in any critical environments. The built-in Watchdog Timer has enhanced the system reliability that achieves a unique feature to distinguish itself from other boards.

Designed for the professional embedded developers, the Socket 478 embedded board EP821 Series is virtually ultimate one-step solution for embedded system applications.

1.1 Specifications

- **CPU: Socket 478 for Intel® Pentium® M/ Celeron® M, LV Intel® Pentium® M, ULV Celeron® M processors**

Processor	FSB
Intel® Pentium® M	400/533MHz
Intel® Celeron® M	400/533MHz
LV Intel® Pentium® M	1.4GHz
ULV Celeron® M	1GHz

- **System Chipset: Intel® 915GM and ICH*6M**
- **BIOS**
  - Phoenix-Award BIOS, Y2K compliant
  - 4Mbit Flash, DMI, Plug and Play
  - PXE Ethernet Boot ROM
  - SmartView for multiple LCD type selection, display mode option and application extension features
  - RPL/PXE Ethernet Boot ROM
  - "Load Optimized Default" customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One x 200-pin DDR2-400 SODIMM socket
  - Maximum to 1GB DDR2 memory
- **L2 Cache:** integrated in CPU
- **Onboard IDE**
  - One PATA-100 with 44-pin 2.0 pitch box-header
  - One SATA-150 connector
- **CompactFlash Socket**
  - One CompactFlash Type II Socket via PATA-100 IDE
- **Onboard Multi-I/O**
  - One 26-pin 2.0 pitch box-header shared with Parallel port
  - 3 x RS-232, 1x RS-232/422/485

- **USB Interface**
  - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Watchdog Timer**
  - 1~255 seconds; up to 255 levels
- **Graphics**
  - 1st LVDS port via SDVO port-A through CH7308 for 18/36/24/48-bit LVDS LCD with 1*Hirose 40-pin connector & 1* 7-pin inverter connector
  - CRT from DAC port with 15-pin D-Sub connector on the rear I/O
- **Expansion Interface**
  - PCI-104 for 32-bit/33MHz PCI stacking expansion
- **Ethernet**
  - 2 * PCIe with co-layout Realtek RTL8111B/8111C for Gigabit/Fast Ethernet with integrated Boot ROM with RPL and PXE
  - Equipped with RJ-45 interface
- **Audio**
  - AC'97 codec audio
  - MIC-in, Line-out
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface)
- **Form Factor**
  - **EPIC form factor**

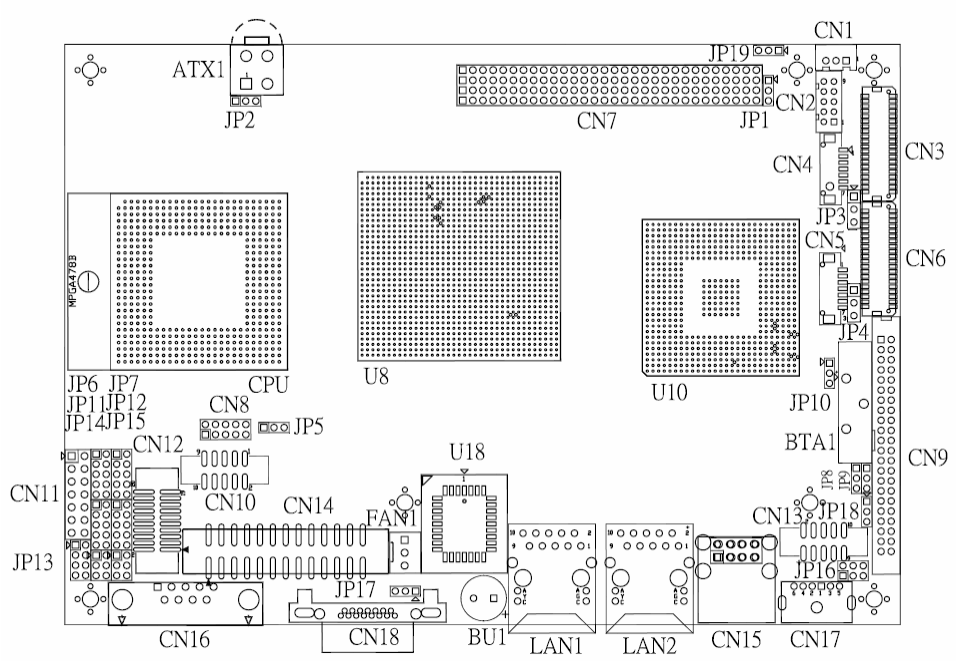
***NOTE**: All specifications and images are subject to change without notice.*

1.2 Utilities Supported

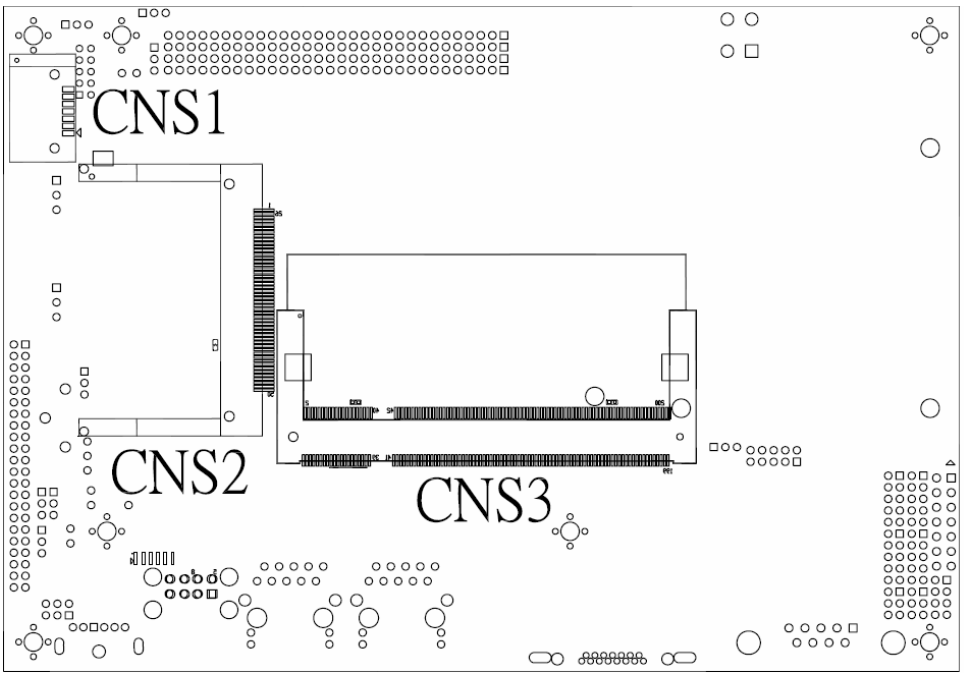
- Chipset Driver
- VGA Driver
- Ethernet Driver
- Audio Driver

Chapter 2
Jumpers and Connectors

2.1 Board Layout and Fixing Holes



Component Side



Solder Side

2.2 Jumper Settings

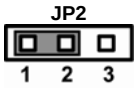
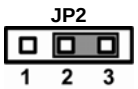
Proper jumer settings configure the **EP821** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Here is a list of jumper settings：

Jumper	Default Setting		Jumper Setting
JP2	ATX/AT Select		Short 1-2
JP3	LVDS1 Voltage Selection Default: 3.3V		Short 1-2
JP4	LVDS2 Voltage Selection Default: 3.3V		Short 1-2
JP5	CPU Type Select : Dothan A		Short 1-2
JP6	COM4 Mode Select	COM4 Pin 1: DCD	Short 7-9
		COM4 Pin 8: RI	Short 8-10
JP7	COM3 Mode Select	COM3 Pin 1: DCD	Short 7-9
		COM3 Pin 8: RI	Short 8-10
JP8	CompactFlash Voltage Selection Default: 5V		Short 1-2
JP9	Normal Operation/Clear CMOS setting Default: Normal Operation		Short 1-2
JP10	CompactFlash Select : Slave		Short 1-2
JP11	COM2 Mode Select	COM2 Pin 1: DCD	Short 7-9
		COM2 Pin 8: RI	Short 8-10
JP12	COM1 Mode Select	COM1 Pin 1: DCD	Short 7-9
		COM1 Pin 9: RI	Short 8-10
JP13	COM1 Mode Select Default: RS-232		Short 1-2
JP14	COM1 Mode Select Default: RS-232		Short 3-5, 4-6
JP15	COM1 Mode Select Default: RS-232		Short 3-5, 4-6

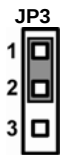
Jumper	Default Setting	Jumper Setting
JP16	Audio Speak Out/Line Out Selection Default: Line Out	Short 1-3, 2-4
JP17	FSB Setting	Short 1-2
JP18	USB1-2 Voltage Selection Default:5VSBY	Short 1-2
JP19	USB3-4 Voltage Selection Default:5VSBY	Short 1-2

2.3.1 ATX/AT Select Jumper: JP2

Description	Function	Jumper Setting
ATX/AT Select	ATX (Default)	
	AT	

2.3.2 LVDS1 Voltage Selection Jumper: JP3

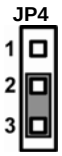
This jumper is to select the voltage for LVDS1 interface.

Description	Function	Jumper Setting
LVDS1 Voltage Select	3.3V (Default)	

	5V	JP3 1 2 3

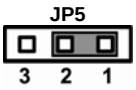
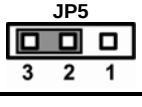
2.3.3 LVDS2 Voltage Selection Jumper: JP4

This jumper is to select the voltage for LVDS4 interface.

Description	Function	Jumper Setting
LVDS2 Voltage Select	3.3V (Default)	
	5V	

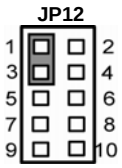
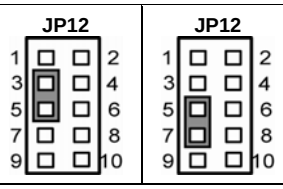
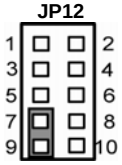
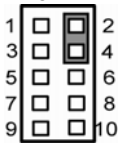
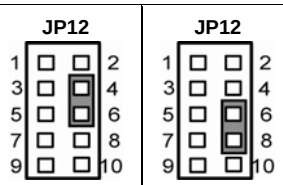
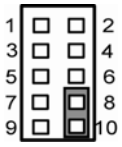
2.3.4 CPU Analog Voltage Select Jumper: JP5

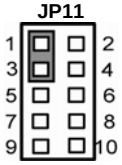
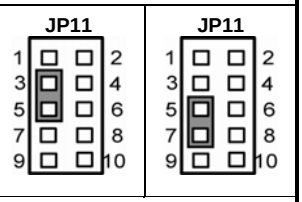
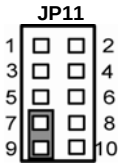
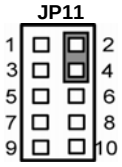
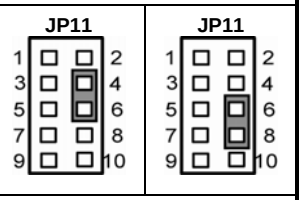
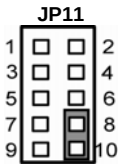
Use this jumper to select the CPU analog voltage.

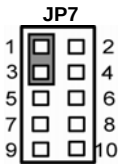
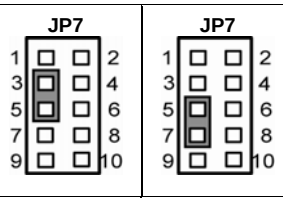
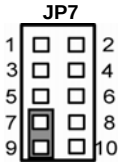
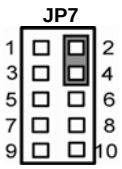
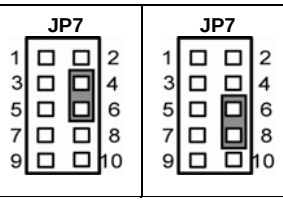
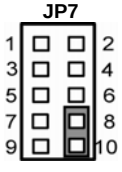
Description	Function	Jumper Setting
CPU Analog Voltage Select	Dothan(1.5V) (Default)	
	Banias(1.8V)	

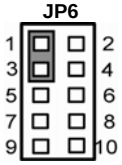
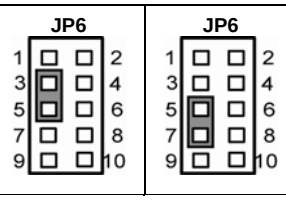
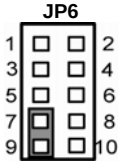
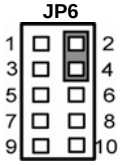
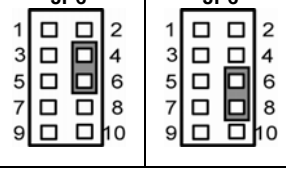
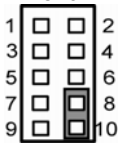
2.3.5 COM1~4 Mode Selection Jumpers: JP6, JP7, JP11, JP12

These jumpers select the COM1, COM2, COM3, COM4 ports' DCD and RI mode.

Description	Function	Jumper Setting
COM1 (CN16)	Pin 1=12V	
	Pin 1=5V	
	*Pin 1=DCD	
	Pin 9=12V	
	Pin 9=5V	
	*Pin 9=RI	

Description	Function	Jumper Setting
COM2 (CN12)	Pin 1=12V	
	Pin 1=5V	
	*Pin 1=DCD	
	Pin 8=12V	
	Pin 8=5V	
	*Pin 8=RI	

Description	Function	Jumper Setting
COM3 (CN10)	Pin 1=12V	
	Pin 1=5V	
	*Pin 1=DCD	
	Pin 8=12V	
	Pin 8=5V	
	*Pin 8=RI	

Description	Function	Jumper Setting
COM4 (CN12)	Pin 11=12V	
	Pin 11=5V	
	*Pin 11=DCD	
	Pin 18=12V	
	Pin 18=5V	
	*Pin18=RI	

2.3.6 CompactFlash Voltage Selection Jumper: JP8

This jumper is to select the voltage for CompactFlash interface.

Description	Function	Jumper Setting
CompactFlash Voltage Selection	3.3V (Default)	
	5V	

2.3.7 CMOS Clear Jumper: JP9

You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	
	Clear CMOS	

2.3.8 CompactFlash Selection Jumper: JP10

Use this jumper to set Master/Slave CompactFlash interface.

Description	Function	Jumper Setting
CompactFlash Selection	Slave (Default)	JP10 1 2 3
	Master	JP10 1 2 3

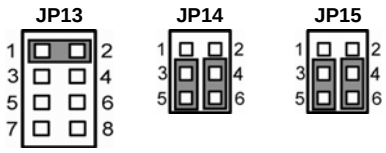
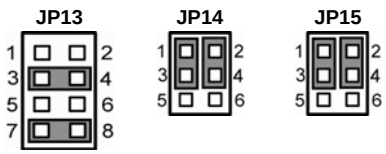
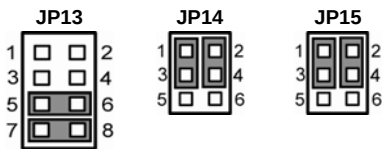
格式化: 項目符號及編號

2.3.9 Audio Output Selection Jumper: JP16

Description	Function	Jumper Setting
Audio Output Selection	Line Out (Default)	JP16 2 4 6 1 3 5
	Speak Out	JP16 2 4 6 1 3 5

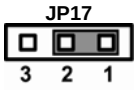
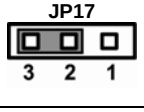
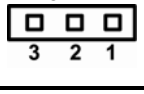
2.3.10 COM1 Mode Selection Jumpers: JP13, JP14, JP15

These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485.

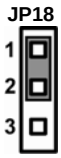
Description	Function	Jumper Setting
COM1	RS-232 (Default)	
	RS-422	
	RS-485	

2.3.11 FSB Setting Jumper: JP17

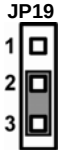
This jumper helps you set the CPU frequency.

Description	Function	Jumper Setting
FSB Setting	Auto (Default)	
	133 MHz	
	100 MHz	

2.3.12 USB1-2 Setting Jumper:JP18

Description	Function	Jumper Setting
USB1-2 Voltage Selection	5VSBY (Default)	
	5V	

2.3.12 USB3-4 Setting Jumper:JP19

Description	Function	Jumper Setting
USB3-4 Voltage Selection	5VSBY (Default)	JP19 
	5V	JP19 

2.4 Connectors

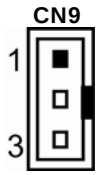
Connectors connect the CPU card with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table shows you all connectors on the EP821 Series.

Connectors	Label
SMBUS Connector	CN1
USB2, USB3 Connector	CN2
LVDS1 Connector	CN3
LVDS1 Backlight Connector	CN4
LVDS2 Backlight Connector	CN5
LVDS2 Connector	CN6
PCI-104	CN7
2*10pin DIO	CN8
Primary IDE Connector	CN9
COM3 Connector	CN10
Flat Panel Bezel Connector	CN11
COM2, COM4 Connector	CN12
Audio Connector	CN13
Printer Port Connector // FDD Connector	CN14
USB0, USB1 Connector	CN15
COM1Connector	CN16
PS/2 Connector	CN17
VGA Connector	CN18
12V Power Connector	ATX1
CPU FAN Connector	FAN1
Ethernet1 Connector	LAN1
Ethernet2 Connector	LAN2
SATA Connector	CNS1
CF Connector	CNS2
DDR RAM Connector	CNS3

2.4.1 SMBUS Connector: CN9

Connector SMBUS1 is for SMBUS interface support.

Pin	Description
1	SMBUS DATA
2	SMBUS CLK
3	GND

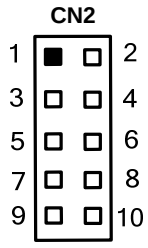


2.4.2 USB Connector: CN2

The Universal Serial Bus (USB) connector on the board is for the installation of peripherals supporting the USB interface. **CN2** is a 10-pin standard onboard USB connector.

USB2 and USB3 Pin Assignment

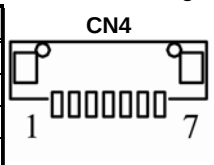
Pin	Description	Pin	Description
1	VCC	2	VCC
3	D2-	4	D3-
5	D2+	6	D3+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



2.4.3 LVDS Backlight Connector: CN4

It is a video connector for working LVDS interface backlight.

Pin	Description
1	12V
2	12V
3	5V
4	ENABLEI
5	GND
6	GND
7	GND

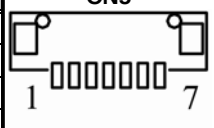


2.4.4 LVDS2 Backlight Connector: CN5

It is a video connector for working LVDS2 interface backlight.

Pin	Description
1	12V
2	12V
3	5V
4	ENABLEI
5	GND
6	GND
7	GND

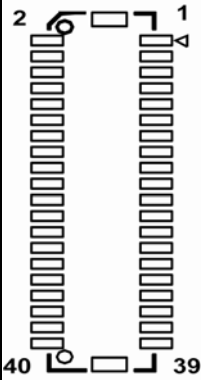
CN5



2.4.5 JST Connector for LVDS1 Flat Panel: CN3

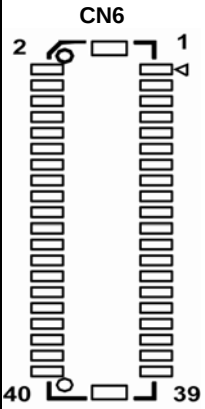
Pin	Description	Pin	Description
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND
41	N.C.	38	N.C.
43	N.C.	40	N.C.

CN3



2.4.6 JST Connector for LVDS2 Flat Panel: CN6

Pin	Description	Pin	Description
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND
41	N.C.	38	N.C.
43	N.C.	40	N.C.



2.4.7 PCI-104 Bus: CN7

The PCI-104 industrial standard and compact form factor of dimensions 3.6" x 3.8" is fully compatible with the ISA Bus. The PCI-104 interface can be applied to off -shelf PCI-104 modules, such as sound module, fax modem module, multi-I/O module.

Pin	Pin Name	Pin	Pin Name	Pin	Pin Name	Pin	Pin Name
A1	N.C	B1	Reserved	C1	+5V	D1	AD0
A2	N.C	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	C/BE0#	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	N.C	C6	AD10	D6	M66EN
A7	AD14	B7	AD13	C7	GND	D7	AD12

Pin	Pin Name	Pin	Pin Name	Pin	Pin Name	Pin	Pin Name
A8	+3.3V	B8	C/BE1#	C8	AD15	D8	+3.3V
A9	SERR#	B9	GND	C9	SB0#	D9	PAR
A10	GND	B10	PERR#	C10	+3.3V	D10	SDONE
A11	STOP*	B11	+3.3V	C11	LOCK#	D11	GND
A12	+3.3V	B12	TRDY#	C12	GND	D12	DEVSEL#
A13	FRAME#	B13	GND	C13	IRDY#	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	C/BE2#
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	C/BE3#	C19	N.C.	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0#	B23	GND	C23	REQ1#	D23	N.C.
A24	GND	B24	REQ2#	C24	+5V	D24	GNT0#
A25	GNT1#	B25	N.C	C25	GNT2#	D25	GND
A26	+5V	B26	CLK0	C26	GND	D26	CLK1
A27	CLK2	B27	+5V	C27	CLK3	D27	GND
A28	GND	B28	INTD#	C28	+5V	D28	RST#
A29	+12V	B29	INTA#	C29	INTB#	D29	INTC#
A30	-12V	B30	Reserved	C30	Reserved	D30	GND

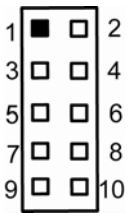
2.4.8 Digital I/O Port (DIO) Connector: CN8

The board is equipped an 8-channel digital I/O connector **CN8** that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers, sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

Please refer to next page for the deailed DIO connector Pin Assignment.

Pin	Description	Pin	Description
1	DO0	2	DO4
3	DO1	4	DI0
5	DO2	6	DI1
7	DO3	8	DI2
9	GND	10	GND

CN8

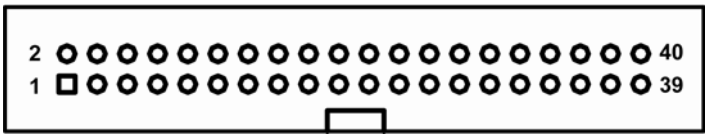


2.4.9 IDE Interface Connector: CN9

There is one built-in IDE channel to support support up to two IDE devices.

CN9: 40-pin IDE interface connector

Pin	Signal	Pin	Signal	Pin	Signal
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 15
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #	39	HDD Active #
40	GND				



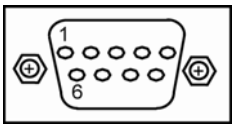
2.4.10 Serial Port Interface Connectors: CN16 (COM1), CN12 (COM2/COM4), CN10 (COM3)

The board has four onboard serial ports that use jumper selection to supply +5V/12V power through pins 1 and 8, or pin 9. COM1 is a standard DB9 connector; COM2, COM3 and COM4 are combo connectors.

COM1 Port Connector Pin Assignment: CN16

Pin	Description
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

CN16

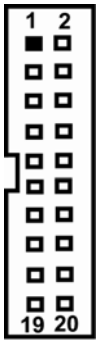


COM2/4 Port Connector Pin Assignments: CN12

COM2/COM4	Description
1	Data Carrier Detect (DCD2)
2	Data Set Ready (DSR2)
3	Receive Data (RXD2)
4	Request to Send (RTS2)
5	Transmit Data (TXD2)
6	Clear to Send (CTS2)
7	Data Terminal Ready (DTR2)
8	Ring Indicator (RI2)
9	Ground (GND)
10	N.C.
11	Data Carrier Detect (DCD4)
12	Data Set Ready (DSR4)
13	Receive Data (RXD4)
14	Request to Send (RTS4)

COM2/COM4	Description
15	Transmit Data (TXD4)
16	Clear to Send (CTS4)
17	Data Terminal Ready (DTR4)
18	Ring Indicator (RI2)
19	Ground (GND)
20	N.C.

CN12

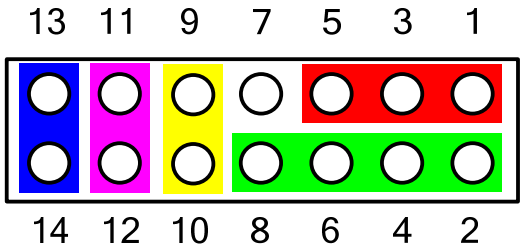


COM3 Port Connector Pin Assignments: CN10

Pin	Description	Pin	Description
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	NC

CN10

2.4.11 Flat Panel Bezel Connector: CN11



- **Power LED**

This 3-pin connector named as Pin 1 and Pin 5 connect the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON.

- **External Speaker and Internal Buzzer Connector**

Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **ATX Power On/Off Button**

This 2-pin connector named as Pin 9 and 10 connect the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**

Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer, not turns OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

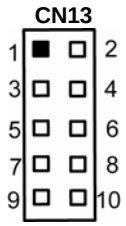
- **HDD Activity LED**

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.12 Audio Connector: CN13

CN13 is a 10-pin connector to support the audio interface.

Pin	Description	Pin	Description
1	MIC-IN	2	GND
3	Line In L	4	GND
5	Line In R	6	GND
7	Audio Out L	8	GND
9	Audio Out R	10	GND



2.4.13 Parallel Port or Floppy Connector: CN14

Print Port Connector (Defaulted)

There is a multi-mode parallel port LPT1 that supports the following modes:

1. **Standard mode:**
   IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port

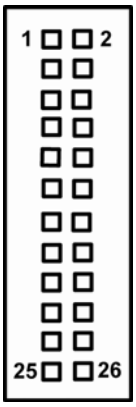
2. **Enhanced mode:**
   Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)

3. **High speed mode:**
   Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

Print Port Connector (Defaulted) Pin Assignment

Pin	Signal	Pin	Signal
1	Auto Form Feed#	2	Strobe#
3	Error#	4	Data 0
5	Initialize#	6	Data 1
7	Printer Select In#	8	Data 2
9	GND	10	Data 3
11	GND	12	Data 4
13	GND	14	Data 5
15	GND	16	Data 6
17	GND	18	Data 7
19	GND	20	Acknowledge#
21	GND	22	Busy
23	GND	24	Paper Empty#
25	NC	26	Printer Select

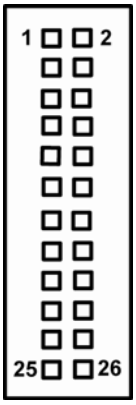
CN14



Floppy Connector (Optional) Pin Assignment

Pin	Signal	Pin	Signal
1	NC	2	DRIVE0
3	NC	4	INDEX
5	NC	6	MOTOR ON
7	NC	8	DSKCHG
9	GND	10	DIR
11	GND	12	STEP
13	GND	14	WDATA
15	GND	16	WGATE
17	GND	18	TRK0
19	GND	20	WPT
21	GND	22	RDATA
23	GND	24	HDSEL
25	NC	26	DSKCHG

CN14



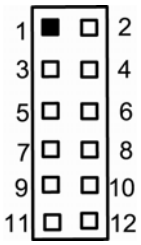
2.4.14 USB Connector: CN15

The Universal Serial Bus (USB) connector on the board is for the installation of peripherals supporting the USB interface. **CN15** is a 12-pin standard onboard USB connector.

USB0 and USB1 Pin Assignment

Pin	Description	Pin	Description
1	VCC	2	VCC
3	D0-	4	D1-
5	D0+	6	D1+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)
11	Ground (GND)	12	Ground (GND)

CN15

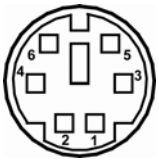


2.4.15 Keyboard and PS/2 Mouse Connector: CN17

The board provides a keyboard and Mouse interface. CN17 is a DIM connector for PS/2 keyboard Connection VIA "Y" Cable.

Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock

CN17

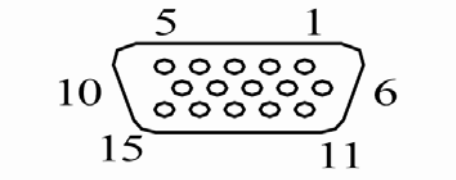


2.4.16 VGA Connector: CN18

The board has a 15-pin D-Sub connector for the CRT VGA display.

Pin	Description	Pin	Description	Pin	Description
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	AGND
7	AGND	8	AGND	9	N/A
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

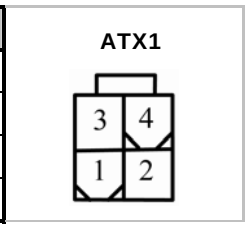
CN18



2.4.17 ATX 12V Power Connector: ATX1

Connect the power cable to ATX1 for +12V ATX power supply, which mainly supplies power to the CPU. If the ATX2 power connector is not connected, the system will not start.

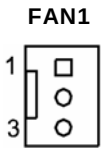
Pin	Description
1	GND
2	GND
3	+12V
4	+12V



2.4.18 CPU Fan Connector

A CPU fan is always needed for cooling CPU heat. The CPU fan connector **FAN1** provides power to the CPU fan.

Pin	Signal
1	Ground
2	+12V
3	Sensor



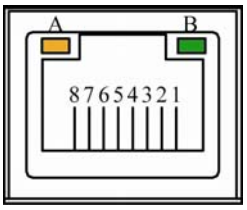
2.4.19 Ethernet RJ-45 Connector: LAN1

The board is equipped with a RJ-45 Ethernet connector. To connect the board to a 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **LAN1** connector, and connect the other end (phone jack) to a 10-Base-T hub or 100-Base-T or 1000-Base-T hub.

LAN1: RJ-45 connector Pin Assignment

Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ-1(For 100 base T-Only)
5	RJ-1(For 100 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 100 base T-Only)
8	RJ-1(For 100 base T-Only)
A	Active LED
B	100/1000 LAN LED

LAN1



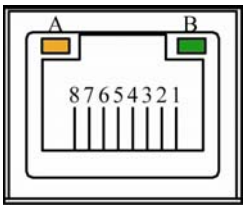
2.4.20 Ethernet RJ-45 Connector: LAN2

The board is equipped with a RJ-45 Ethernet connector. To connect the board to a 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **LAN2** connector, and connect the other end (phone jack) to a 10-Base-T hub or 100-Base-T or 1000-Base-T hub.

LAN1: RJ-45 connector Pin Assignment

Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ-1(For 100 base T-Only)
5	RJ-1(For 100 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 100 base T-Only)
8	RJ-1(For 100 base T-Only)
A	Active LED
B	100/1000 LAN LED

LAN2

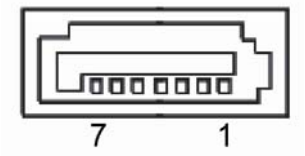


2.4.21 SATA Connector: CNS1

The SATA connector CNS1 is for high-speed SATA interface port and it can be connected to serial ATA hard disk devices.

Pin	Description	Pin	Description
1	GND	2	STXP
3	STXN	4	GND
5	SRXN	6	SRXP
7	GND		

CNS1



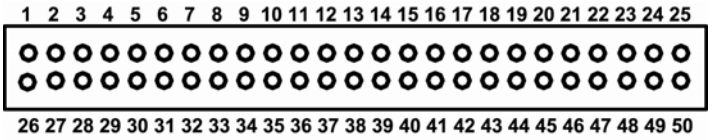
2.4.22 CompactFlash™ Socket: CNS2

The board is equipped with a CompactFlash disk type-II socket on the solder side that supports the IDE interface CompactFlash disk card with DMA mode supported. The socket is especially designed to avoid any incorrect installation of the CompactFlash disk card.

Pin	Description	Pin	Description
1	GND	26	CD1-
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC

14	Address 6	39	CSEL#
Pin	**Description**	**Pin**	**Description**
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY#
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10
25	CD2#	50	GND

CNS2



MEMO

Chapter 3
Hardware Description

3.1 Microprocessors

The EP821 Series supports Socket 478 for Intel® Pentium® M/Celeron® M processors with FSB400/533MHz, LV Intel® Pentium® M 1.4GHz and ULV Celeron® M 1GHz processors, which make your system operated under Windows 2000/XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

The EP821 Series uses Award Plug and Play BIOS with a single 4Mbit Flash EPROM.

3.3 System Memory

The EP821 Series industrial CPU card supports one 200-pin DDR2-400 SODIMM sockets for a maximum memory of 1GB DDR2 SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB, 1GB and 2GB.

3.4 I/O Port Address Map

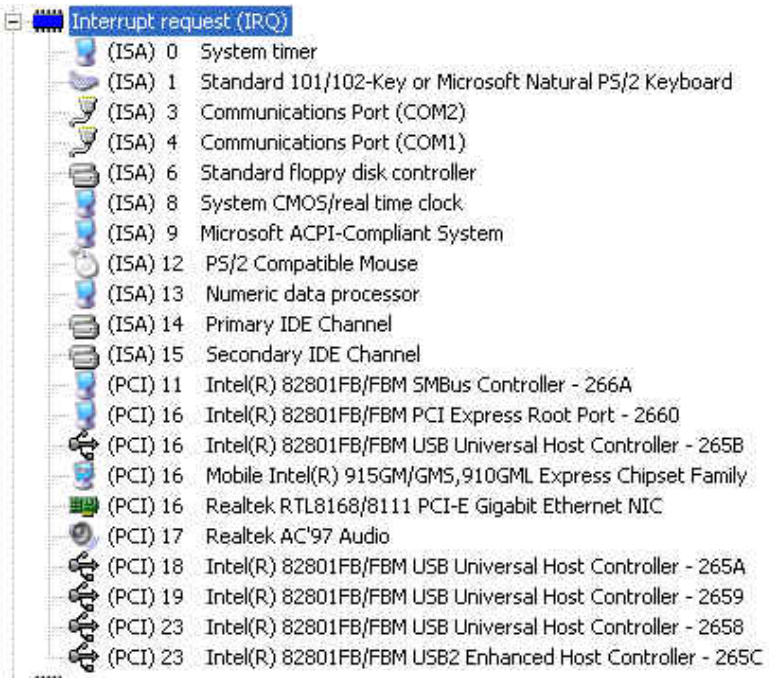
The Intel® Pentium® M/Celeron® M CPUs can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.

-- I/O Port Address Map under XP OS (1) --

-- I/O Port Address Map under XP OS (2) --

3.5 Interrupt Controller

The **EP821 Series** is a 100% PC compatible control board. The mapping list under XP OS is shown as the following screen.



-- Interrupt Request Map under XP OS --

Chapter 4
Award BIOS Utility

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the Setup information whenever the power is turned off.

4.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

4.2 Control Keys

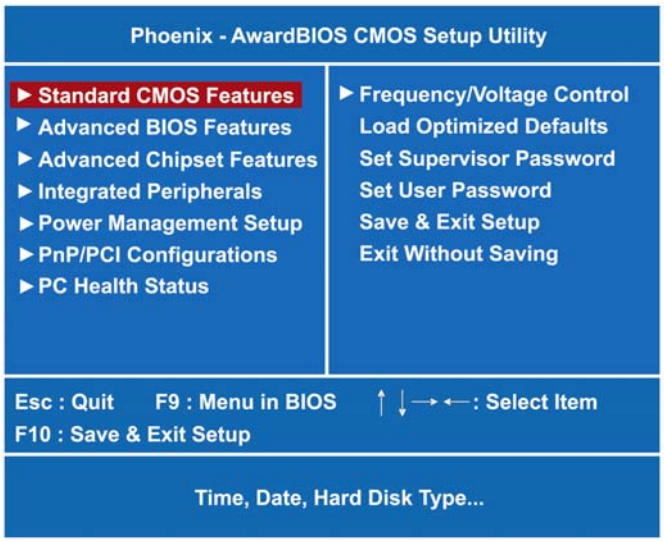
Up arrow	Move cursor to the previous item
Down arrow	Move cursor to the next item
Left arrow	Move cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+" key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Getting Help

- **Main Menu**
  The online description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop out a small Help window that provides the description of using appropriate keys and possible selections for highlighted items. Press <F1> or <Esc> to exit the Help Window.

4.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.

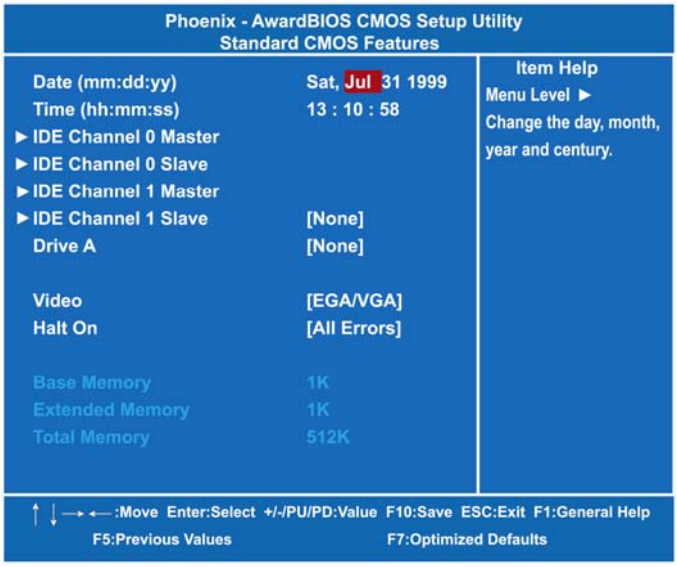


NOTE: *If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.5 Standard CMOS Setup Menu

The Standard CMOS Setup Menu displays basic information about your system. Use arrow keys to highlight each item, and use <PgUp> or <PgDn> key to select the value you want in each item.



- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	It is determined by the BIOS and read only, from Sunday to Saturday.
date	It can be keyed with the numerical/ function key, from 1 to 31.
month	It is from January to December.
year	It shows the current year of BIOS.

- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **IDE Channel 0 Master/IDE Channel 0 Slave/IDE Channel 1 Master/IDE Channel 1 Slave**
  These items identify the types of each IDE channel installed in the computer. There are 45 predefined types (Type 1 to Type 45) and 2 user's definable types (Type User) for Enhanced IDE BIOS. Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type, or directly type the number and press <Enter>. Please be noted your drive's specifications must match the drive table. The hard disk will not work properly if you enter improper information. If your hard disk drive type does not match or is not listed, you can use Type User to manually define your own drive type.
  If selecting Type User, you will be asked to enter related information in the following items. Directly key in the information and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the HDD interface controller supports ESDI, select "Type 1".
  If the HDD interface controller supports SCSI, select "None".
  If the HDD interface controller supports CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

- **Dive A**
  The item identifies the type of floppy disk installed in the computer as drive A.

None	No floppy drive installed
360K, 3.5 in	3.5 inch PC-type standard drive; 360Kb Mini ITXcity
1.2M, 3.5 in	3.5 inch AT-type high-density drive; 1.2MB Mini ITXcity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb Mini ITXcity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB Mini ITXcity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB Mini ITXcity

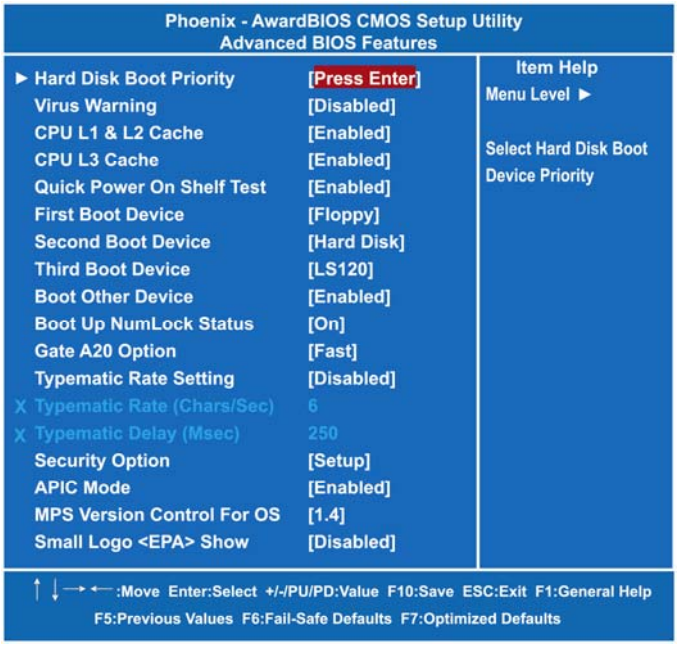
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.
All, But Diskette	The system booting will not stop for a disk error; it will stop for other errors.
All, But Disk/Key	The system booting will not stop for a keyboard or disk error; it will stop for other errors.

Press <Esc> to return to the Main Menu page.

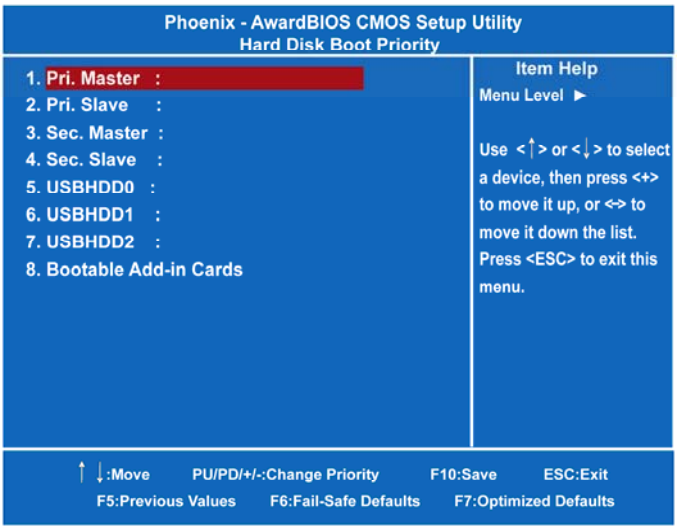
4.6 Advanced BIOS Features

This section allows you to configure and improve your system, to set up some system features according to your preference.



- **Hard Disk Boot Priority**

  Scroll to this item and press <Enter> to view the sub menu to decide the disk boot priority.



Press <Esc> to return to the Advanced BIOS Features page.

- **Virus Warning**

  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is "*Disabled*".

> ***! WARNING !***
>
> *Disk boot sector is to be modified*
> *Type "Y" to accept write or "N" to abort write*
> *Award Software, Inc.*

Enabled	It automatically activates while the system boots up and a warning message appears for an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear for attempts to access the boot sector or hard disk partition table.

***NOTE**: This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU L1 & L2 Cache**
  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is *"Enabled"*. CPUs without built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **CPU L3 Cache**
  Use this item to enable L3 cache only for the CPUs with such a function.

- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.

- **Boot Other Device**

This item allows users to enable or disable the boot device not listed in the First/Second/Third boot devices option above. The default setting is "*Enabled*".

- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is *"On"*.

- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This item determines the typematic rate of the keyboard. The default value is *"Disabled"*.

Enabled	Enable typematic rate and typematic delay programming.
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items, controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to character numbers typed per second by the keyboard. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option defines how many milliseconds must elapse before a held-down key begins generating repeat characters. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	If a wrong password is entered at the prompt, the system will not boot, the access to Setup will be denied, either.
Setup	If a wrong password is entered at the prompt, the system will boot, but the access to Setup will be denied.

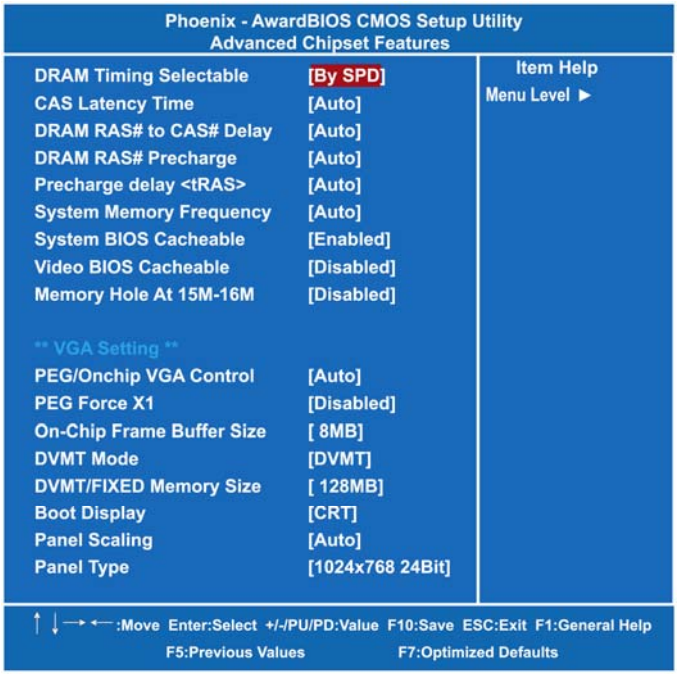
NOTE: *To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **APIC Mode**
  Use this item to enable or disable APIC (Advanced Programmable Interrupt Controller) mode that provides symmetric multi-processing (SMP) for systems.
- **MPS Version Control For OS**
  This item specifies the version of the Multiprocessor Specification (MPS). Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability.
- **Small Logo(EPA) Show**
  If enabled, the EPA logo will appear during system booting up; if disabled, the EPA logo will not appear.

Press <Esc> to return to the Main Menu page.

4.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.



- **DRAM Timing Selectable**
  Use this item to increase the timing of the memory. This is related to the cooling of memory.
- **CAS Latency Time**
  You can select CAS latency time to HCLKs 2, 3, or Auto. The board designer should have set up these values in accordance with the installed DRAM. Do not change these values unless you have to change the specifications of the installed DRAM or CPU.
- **DRAM RAS# to CAS# Delay**
  When DRAM is refreshed, both rows and columns are addressed separately. This field lets you insert a timing delay between the

CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed.

- **DRAM RAS# Precharge**
  The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.
- **Precharge Delay <tRAS>**
  The precharge time is the number of cycles it takes for DRAM to accumulate its charge before refresh.
- **System Memory Frequency**
  This item helps you set main memory frequency. When using an external graphics card, it can be adjusted to enable the best performance for your system.
- **System BIOS Cacheable**
  Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is *"Disabled"*.
- **Video BIOS Cacheable**
  This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.
- **Memory Hole At 15M-16M**
  You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

***** VGA Setting *****

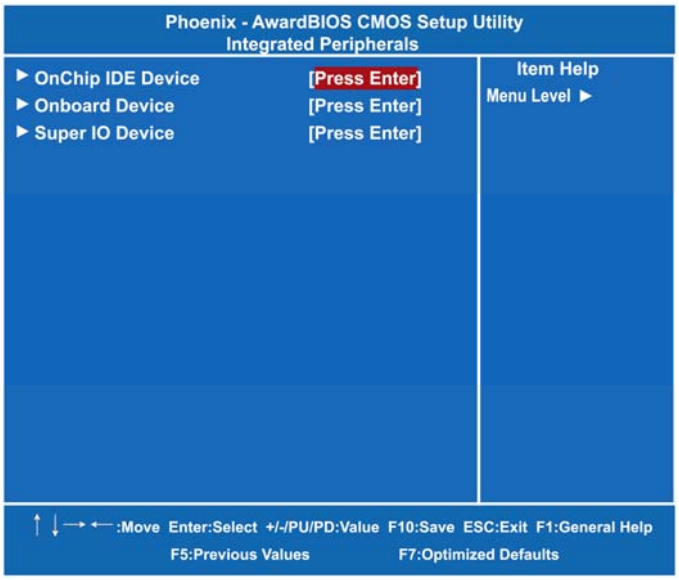
- **PEG/Onchip VGA Control**
  Use this item to choose the primary display card.
- **PEG Force X1**
  Use this item to select PCI Express X1 forcedly.
- **On-Chip Frame Buffer Size**
  Use this item to set the VGA frame buffer size.

- **DVMT Mode**
  DVMT (Dynamic Video Memory Technology) helps you select the video mode.
- **DVMT/Fixed Memory Size**
  DVMT (Dynamic Video Memory Technology) allows you to select a maximum size of dynamic amount usage of the video memory. The system would configure the video memory dependent on your application.
- **Boot Display**
  This item is for Intel define ADD card only.

Press <Esc> to return to the Main Menu page.

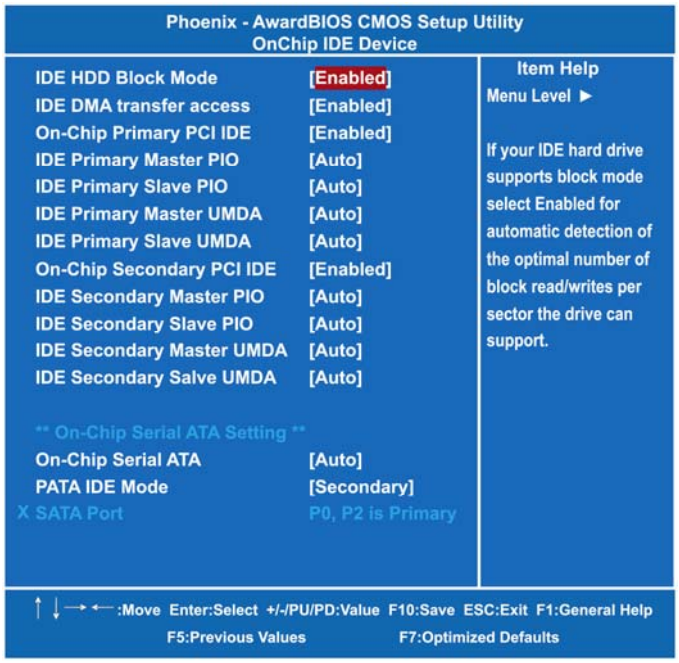
4.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.



- **OnChip IDE Device**

  Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.



  - **IDE HDD Block Mode**
    Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
  - **IDE DMA transfer access**
    Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.
  - **On-Chip Primary/Secondary PCI IDE**
    The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately. The default value is *"Enabled"*.

    ***NOTE**: Choosing Disabled for these options will*

automatically remove the IDE Primary Master/ Slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.

- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
- **IDE Primary/Secondary Master/Slave UDMA**
  Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.

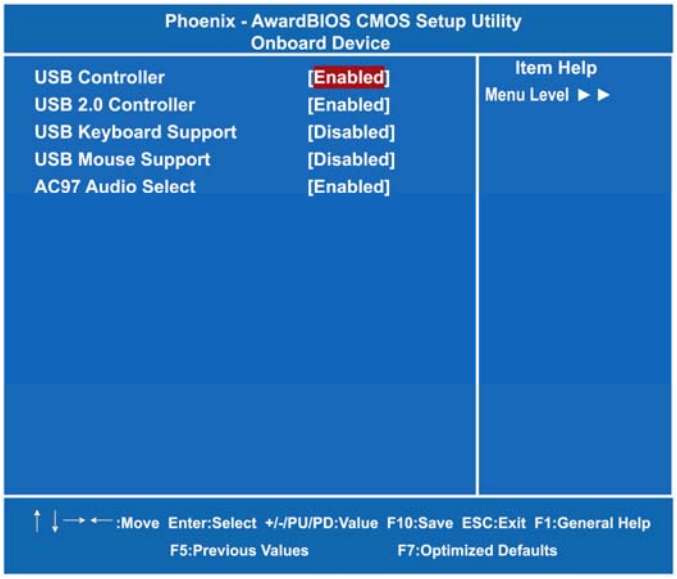
***** On-Chip Serial ATA Setting *****

- **On-Chip Serial ATA**
  Use this item to enable or disable the built-in on-chip serial ATA.
- **PATA IDE Mode**
  Use this item to set the PATA IDE mode. When set to Primary, P1 and P3 are Secondary; on the other hand, when set to Secondary, P0 and P2 are Primary.
- **SATA Port**
  If the "PATA IDE Mode" is Primary, it will show " P1, P3 is Secondary" which means SATA 2 and SATA 4 are Secondary. If the "PATA IDE Mode " is Secondary, it will show " P0, P2 is Primary " which means SATA 1 and SATA 3 are Primary.

Press <Esc> to return to the Integrated Peripherals page.

- **Onboard Device**

  Scroll to this item and press <Enter> to view the sub menu Onboard Device.

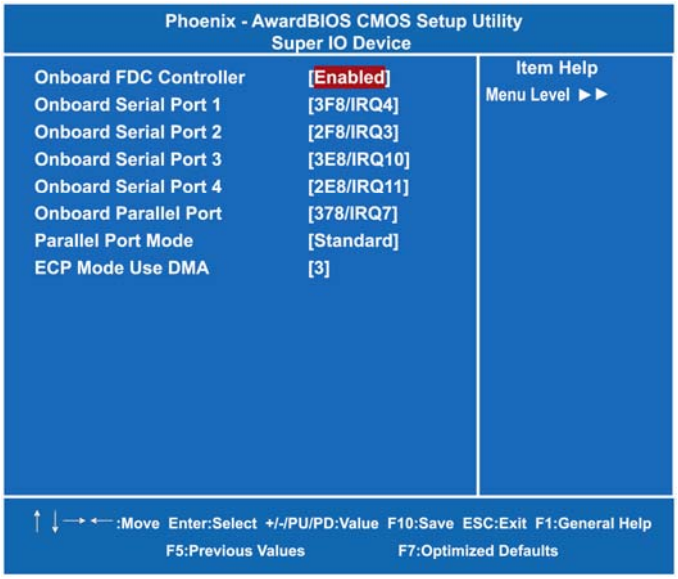


  - **USB Controller**
    Enable this item if you are using the USB in the system. You should disable this item if a higher-level controller is added.
  - **USB 2.0 Controller**
    Enable this item if you are using the EHCI (USB2.0) controller in the system.
  - **USB Keyboard Support**
    Enable this item if the system has a Universal Serial Bus (USB) controller, and you have a USB keyboard.
  - **USB Mouse Support**
    Enable this item to boot the hard drive by a USB mouse.
  - **AC'97 Audio Select**
    Use this item to enable or disable the onboard AC'97 Audio function.

Press <Esc> to return to the Integrated Peripherals page.

- **Super IO Device**

  Scroll to this item and press <Enter> to view the sub menu Super IO Device.



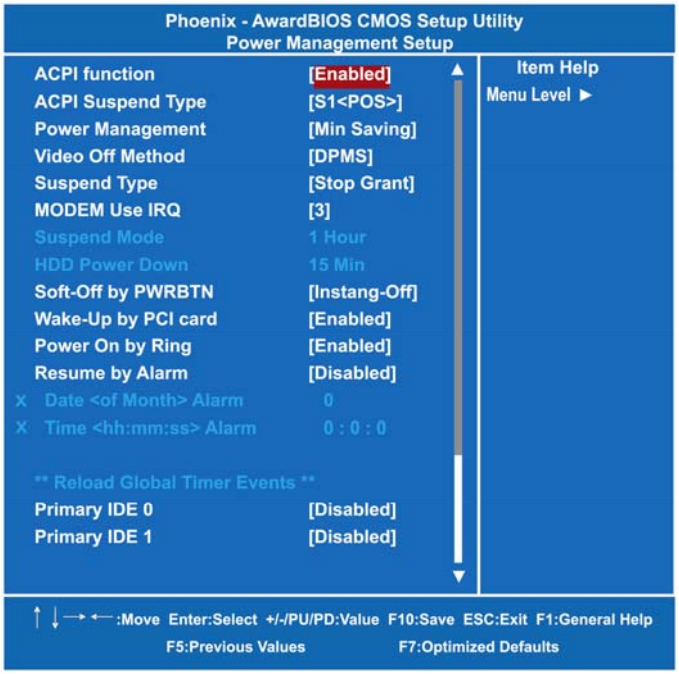
  - **Onboard FDC Controller**
    Select Enabled, if your system has a floppy disk controller (FDC) installed on the system board and you want to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Options: Enabled and Disabled.
  - **Onboard Serial Port 1/2/3/4**
    Select an address and corresponding interrupt for the serial port. Options: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ10, 2E8/IRQ11, 338/IRQ5, 238/IRQ7, Auto and Disabled.
  - **Onboard Paralellel Port**
    This item allows you to determine the I/O address for onboard parallel port. Options: 378/IRQ7, 278/IRQ5, 3BC/IRQ7 and Disabled.
  - **Parallel Port Mode**
    Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field.

- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port while using the ECP mode.

Press <Esc> to return to the Integrated Peripherals page, and press it again to the Main Menu.

4.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.



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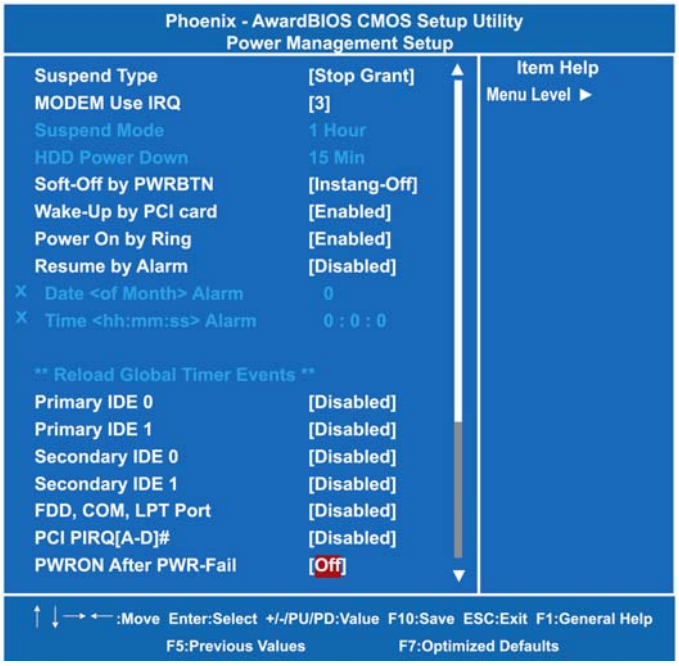


-- (2) --

- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always "*Enabled*".

- **ACPI Suspend Type**
  This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

  [S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

  [S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used

to restore the system when a "wake up" event occurs.

- **Power Management**
  This option allows you to select the type of power Management. Options: APM, ACPI.
- **Video Off Method**
  This setting determines the manner in which the monitor is blanked.

V/H SYNC+Blank	It turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the supplied software for your video subsystem to select video power management values.
Blank Screen	The System only writes blanks to the video buffer.

- **Suspend Type**
  If this item is set to the default Stop Grant, the CPU will go into Idle Mode during power saving mode.
- **Moden Use IRQ**
  If you want an incoming call on a modem to automatically resume the system from a powersaving mode, use this item to specify the interrupt request line (IRQ) used by the modem. You might have to connect the fax/modem to the board Wake On Modem connector for working this feature.
- **Suspend Mode**
  After a selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	The System will never enter the SUSPEND mode.
1/2/4/6/8/10/20/30/40 Min/1 Hr	It defines continuous idle time before the system entering the SUSPEND mode. If any item defined in (J) is enabled and active, the SUSPEND timer will be reloaded.

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.

- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows users to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

Instant-Off	This option follows the conventional manner of system performance when turning the power to OFF. Instant-Off is a software power OFF sequence requiring the power supply button is switched to OFF.
Delay 4 Sec.	Upon the system's turning OFF through the power switch, this option will delay the complete system power OFF sequence approximately 4 seconds. Within this delay period, the system will temporarily enter into the Suspend Mode enabling you to restart the system at once.

- **Wake-Up by PCI card**
  If enable this item, the system can automatically resume when the PCI Modem or PCI LAN card receives an incoming call.
- **Power On by Ring**
  This option allows the system to resume or wake up upon detecting any ring signals coming from an installed modem. The default value is *"Enabled"*.
- **Resume by Alarm**
  If enable this item, the system can automatically resume after a fixed time in accordance with the system's RTC (realtime clock).

**** Reload Global Timer Events ****

Global Timer (power management) events can prevent the system from entering a power saving mode or can awaken the system from such a mode.

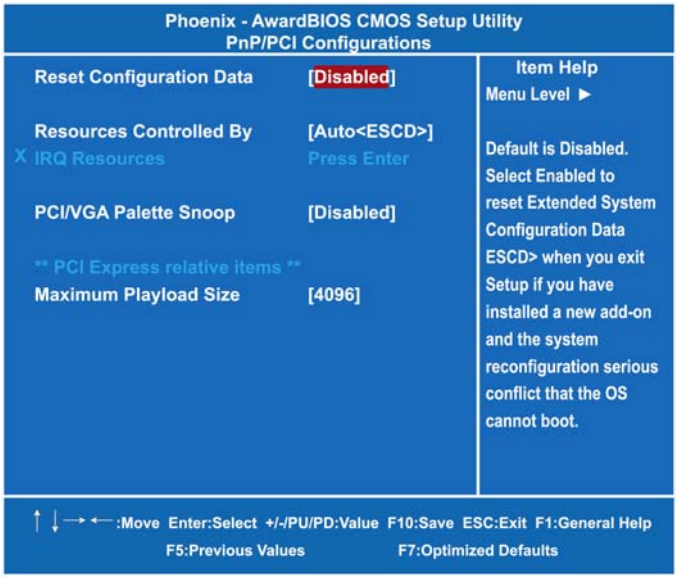
- **Primary/Secondary IDE 0/1**
  Use this item to configure the IDE devices monitored by the system.
- **FDD, COM, LPT Port**
  Use this item to configure the FDD, COM and LPT ports monitored by the system.
- **PCI PIRQ[A-D]#**
  This item can be used to detect PCI device activities; if no activity, the system will enter the sleep mode.

- **PWRON After PWR-Fail**
  This item enables your computer to automatically restart or return to its operating status.

Press <Esc> to return to the Main Menu page.

4.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.



- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options: Enabled, Disabled.
- **Resources Controlled By**

The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is *"Manual"*.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:
  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default value is *"PCI/ISA PnP"*.

- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

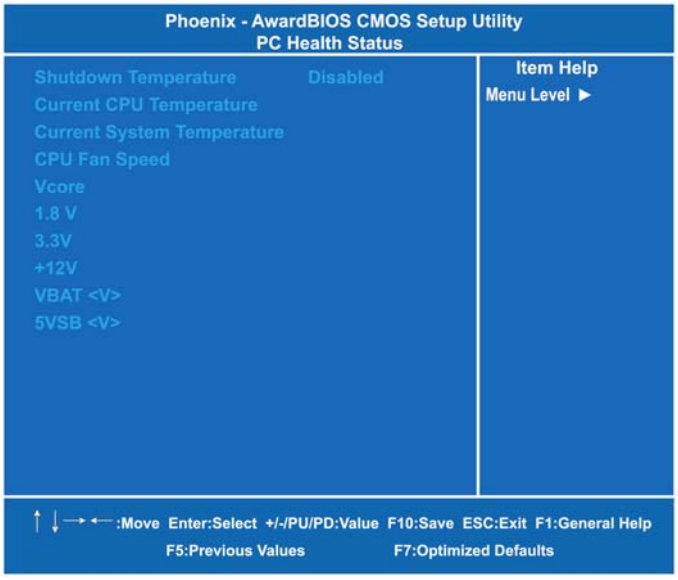
**** PCI Express relative items ****

- **Maximum Payload Size**
  When using DDR SDRAM and Buffer size selection, another consideration in designing a payload memory is the size of the buffer for data storage. Maximum Payload Size defines the maximum TLP (Transaction Layer Packet) data payload size for the device.

Press <Esc> to return to the Main Menu page.

4.11 PC Health Status

This section supports hardware monitering that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.

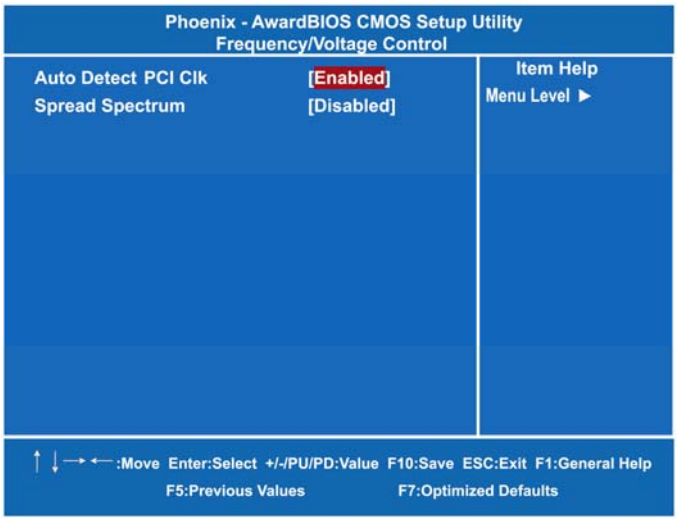


- **Shutdown Temperature**
  It helps you set the maximum temperature they system can reach before powering down.
- **Current CPU Temperature**
  The current system CPU temperature will be automatically detected by the system.
- **Current SYSTEM Temperature**
  Show you the current system temperature.
- **Current CPU FAN Speed**
  These optional and read-only items show current speeds in RPM (Revolution Per Minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.
- **Vcore 1.8V/3.3V/+12V/VBAT(V)/5VSB(V)**
  Show you the voltage of 1.8V/3.3V/+12V/VBAT/5VSB.

Press <Esc> to return to the Main Menu page.

4.12 Frequency/Voltage Control

This section is to control the CPU frequency and Supply Voltage, DIMM OverVoltage and AGP voltage.

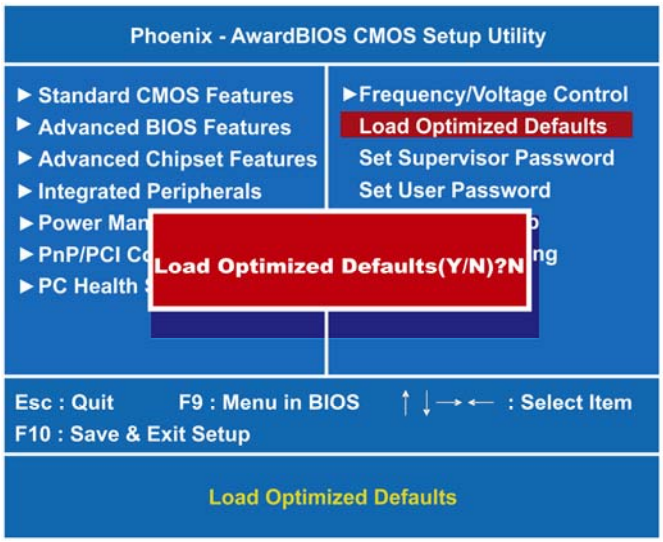


- **Auto Detect PCI Clk**
  The enabled item can automatically disable the clock source for a PCI slot without a module, to reduce EMI (ElectroMagnetic Interference).
- **Spread Spectrum**
  If spread spectrum is enabled, EMI (ElectroMagnetic Interference) generated by the system can be significantly reduced.

Press <Esc> to return to the Main Menu page.

4.13 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

4.14 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1. **Supervisor password:** You can enter and change the options on the setup menu.
2. **User password:** You can just enter, but have no right to change the options on the setup menu.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

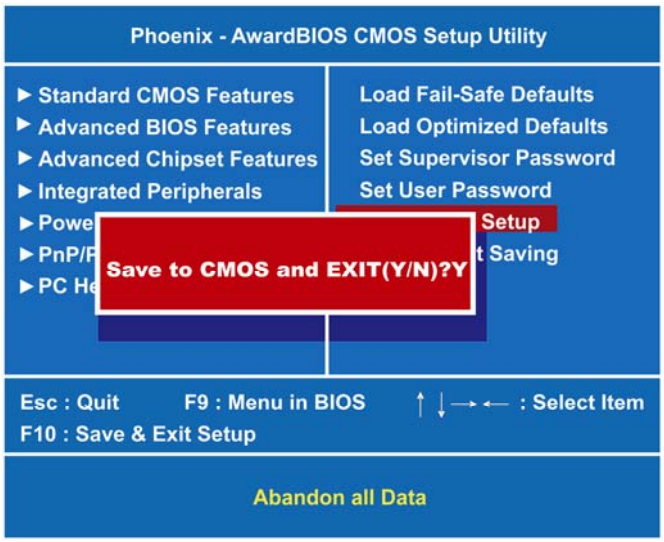
When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

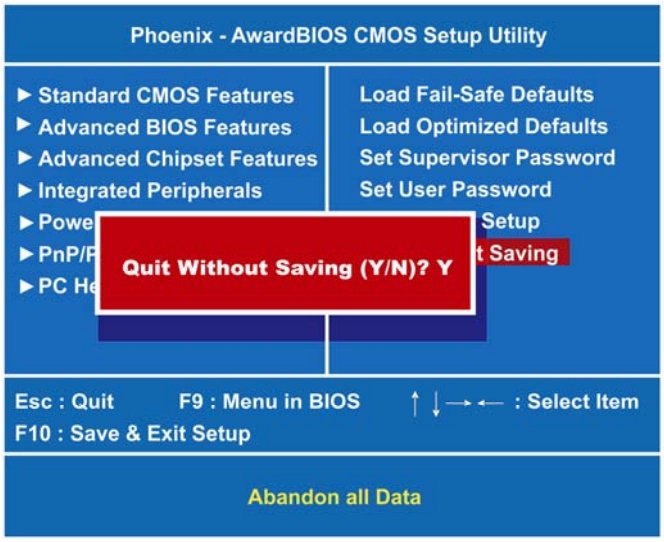
4.15 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Setup utility.



4.16 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications. Type "N" to return to the Setup utility.



A p p e n d i x A
Watchdog Timer

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start
↓
Un-Lock WDT:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
Select Logic device:
O 2E 07
O 2F 08
↓
Activate WDT:
O 2E 30
O 2F 01
↓
Set Second or Minute :
O 2E F5
O 2F N N=00 or 08(See below table)
↓
Set base timer :
O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓

WDT counting re-set timer :
O 2E F6
O 2F M ; M=00,01,02,…FF(See below table)

; IF to disable WDT:

O 2E 30
O 2F 00 ; Can be disable at any time

- Timeout Value Range
  - 1 to 255
  - Minute / Second
- Program Sample

  Watchdog Timer can be set to system reset after 5-second timeout.

2E, 87	
2E, 87	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F5	
2F, N	Set Minute or Second N=08 (Min),00(Sec)
2E, F6	
2F, M	Set Value M = 00 ~ FF

Appendix B
Digital I/O

Digital I/O Software Programing

- GPI program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F F2	Activate GPIO5
O 2E E0	
O 2F FF	GPIO5 pins are programmed as input pins.
O 2E E1	Read only from pin
I 2F	Display input read value

- GPO program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 7
O 2E 30	
O 2F F2	Activate GPIO5
O 2E E0	
O 2F 00	GPIO5 pins are programmed as output pins.
O 2E E1	
O 2F FF	GPIO5 port output HI