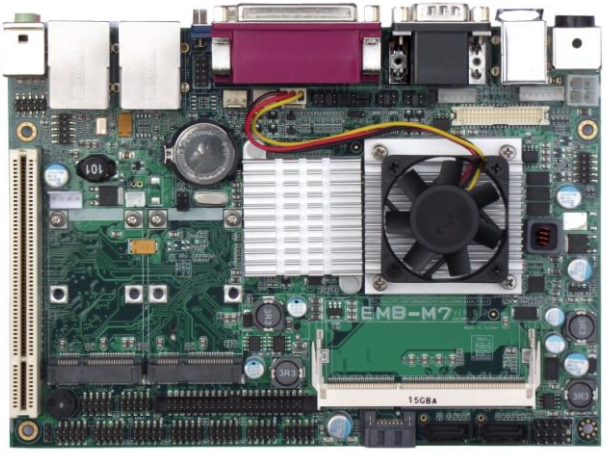
EMB-M7

Intel® Atom D525 Embedded Board



User's Manual

Version 1.0

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Contents

Introduction

This manual is designed to give you information on the EMB-M7 Industrial Main Board.
The topics covered in this manual are as follows:

- ✓ **Features**
- ✓ **Specification**
- ✓ **Jumper setting and Connectors**
- ✓ **BIOS Setup**
- ✓ **Appendix**

Chapter 1 Features & Specifications

❖*Features*

- Intel Dual Core Atom Processor D525 on board.
- Dual GbE LAN, Dual DDR3 socket for up to 4GB.
- Compact size design with rich I/O functions.
- Multiple I/O functions: 8 x USB2.0, 6 x COM, 3 x SATA, 1 x IRDA, 1x PIDE, 1x CF, 1x LPT, 1x DIO.
- Multiple display devices: VGA1, VGA2, HDM, Single Channel 24-bits LVDS LCDI.
- Single DC +12V input power for normal operation.
- Dual Mini Card Socket and one PCI 32-bits slot for flexible I/O expansion.
- 7.1 channels surrounding audio support.

❖Specifications

Processor

- Intel Dual Core Atom D525 processor on board.
- 1.8GHz Core Speed with dual Core and four Threads.

BIOS

- Award Standard PnP Flash BIOS 6.0.
- 8Mbit FlashROM with BootBlock for fail-safe.

System Memory

- Two DDR3 SO-DIMM Sockets.
- Supports DDR3-800 non-ECC memory up to 4.0 GB.

Chipset

- Intel ICH8M chipset.

Video

- Intel D525 Integrated GMA3150 graphic engine.
- One D-Sub female connector for CRT displays.
- One 40-pins connector for single 24-bits LVDS LCD.
- One HDMI for HD 1080p displays.
- Dual VGA display supported.
- Support dual Independent display, display devices can be selectable by BIOS or graphic drivers.

10/100M/1000M Ethernet

- Two Realtek RT8111E on board for Dual Gigabit LAN support.
- PXE Boot ROM and WOL supported.

On Board I/O

- Six serial ports as COM1~COM6. COM2 is RS232/422/485 selectable by jumper.
- COM1 and COM2 are D-Sub on rear panel. Pin9 is powered with either +5V or +12V by jumper.

- COM3~COM6 are pin-header for internal connections.
- One parallel port supports SPP/ECP/EPP mode.
- 1 x IrDA port. 1x DIO (8-bits).
- Dual Mini PCI-Express sockets.
- One PCI 32-bits slot, supports up to 3 master devices.
- Eight USB 2.0 ports. Four on real panel and four for internal connections.

PIDE and SATA

- PIDE controller built in ICH8M support up to UltraDMA mode 5 or ATA100 speed.
- One standard 44-pins box header to supports 2.5" HDD or DOM Flash Disk.
- Three SATA ports from ICH8M support up to SATA-II devices.
- One 50-pins CF-II socket for Compact Flash Card.

Watchdog Timer

- Programmable watchdog timer for 1~255 seconds.

CMOS

- On-board RTC with 242 bytes of Battery-back CMOS RAM.

Audio

- RealTek ALC888 High-Definition Audio chip on-board.
- Two Audio-Jacks on rear for Audio Line-out and MIC.
- 7.1 channel surrounding audio supported.

Power

- Single DC 12V input with 4-pins Mini-DIN connector.
- Supplies +5V and +12V output power for peripheral devices and LCD panel.

Software Compatibility

- Microsoft windows: Win7 32/64bits, Win XP 32/64bits, XP embedded standard, WinCE 6.0.
- Linux 32/64bits and DOS 6.22.

Cooling

- Three cooling FAN connectors.
- One for CPU cooler and two for System FAN.

Dimensions

- 190mm (W) x 135mm (L).
- 4 screw holes on four corners.

Operating Temperature

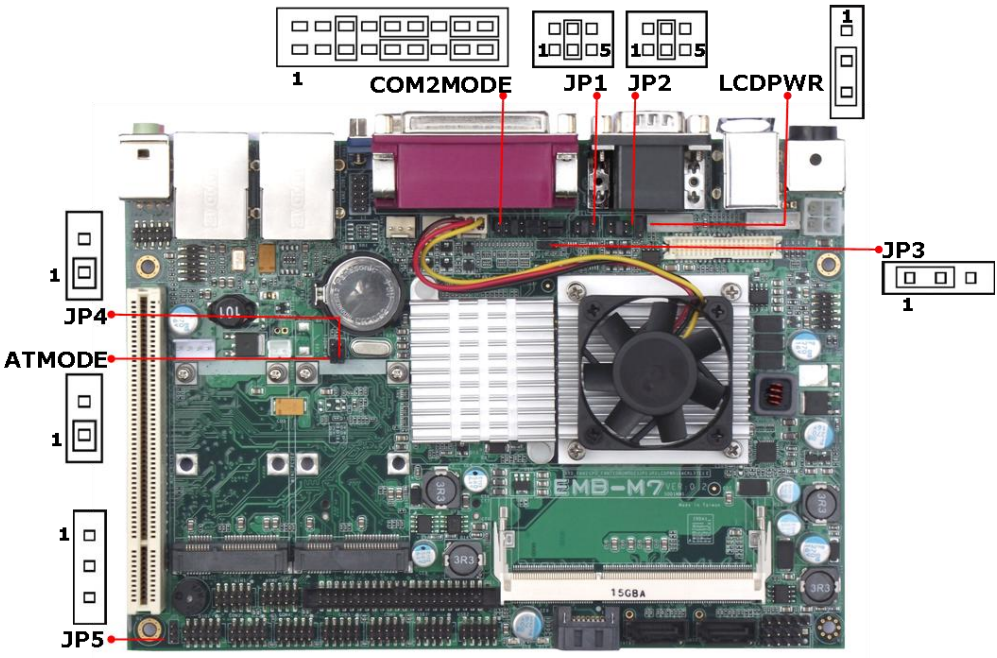
- 0 to 60 °C operating Range.
- Relative Humility: 5~95%, non-condensing.

Chapter 2 Jumper setting & Connectors

2.1 Jumpers on the EMB-M7

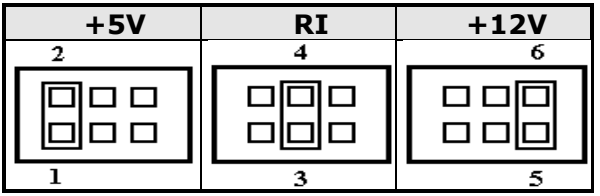
The jumpers on the EMB-M7 allow you to configure your Main Board according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative. The following table lists the jumpers on EMB-M7 and their respective functions.

Jumper Locations on the EMB-M7



JP1, JP2: COM Power Selection

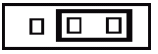
JP1, JP2 can be used to select the COM supple power: +5V, Ring-IN or +12V.
JP1: COM2Pin9 power or Ring-IN
JP2: COM1 pin9 power or Ring-IN



JP3: Clear CMOS RAM Data

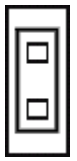
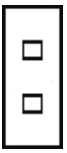
This 3-pin Jumper allows the user to disconnect the built-in 3V battery power to clear the information stored in the CMOS RAM. To clear the CMOS data:

1. Turn off the system power.
2. Remove Jumper cap from pin1&2.
3. Short the pin2 and pin3 for three seconds.
4. Put Jumper cap back to pin1 & 2.
5. Turn on your computer.
6. Hold Down <Delete> during boot up and enter BIOS setup to enter your preferences.

COMS	NORM	CLR
JP3	1-2 	2-3 

JP4: CF Card Mode Selection

This Jumper is to select the CF works as Secondary Channel Master Device or Slave Device.

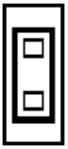
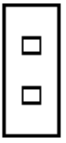
Master	Slave
 JP4	 JP4

JP5: COM1 Power Pin (Pin9)

JP5 can be used to select the COM supple power: +5V or +12V.
JP5: COM6 Pin9 power

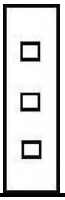
+5V	+12V
 1	 1

AT MODE: AT Mode Selection

AT Mode	ATX Mode
1 	1 

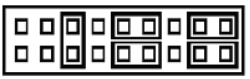
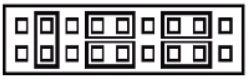
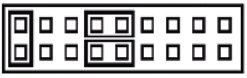
LCDPWR: LCD PANEL Power Selection

LCDPWR can be used to select the Panel LCD supple power: +3.3V or +5V.The default setting is on +3.3V.User need to check the LCD panel spec and adjust this jumper to make Panel work in specified power rail. This Jumper serves LVDS LCD connector.

LCDPWR	+5V	+3.3V
1 	1 	1 

COM2MODE: RS232/RS422/RS485

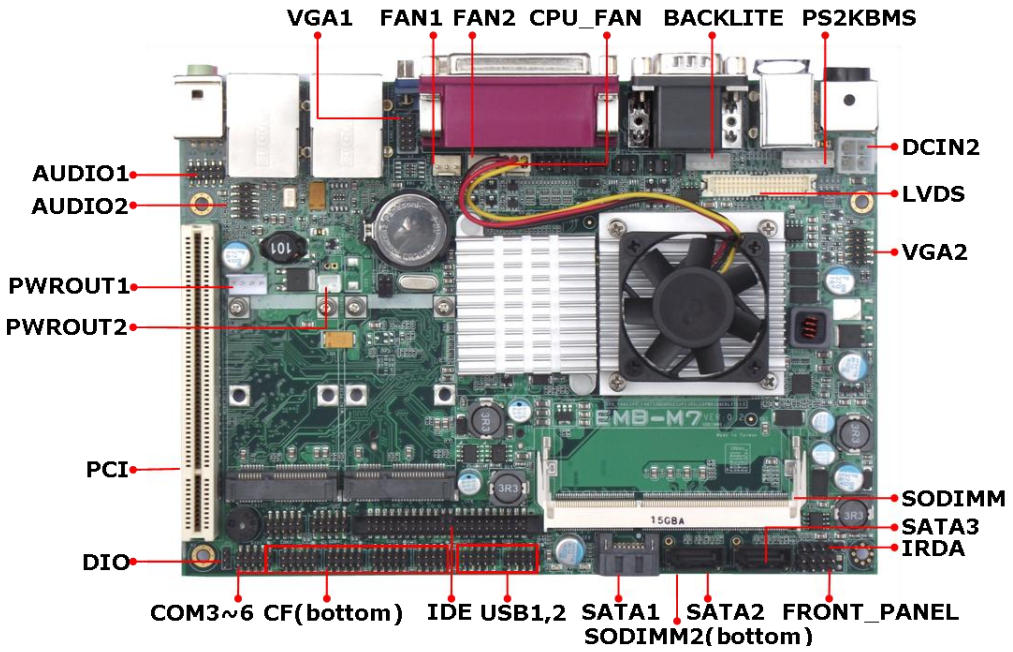
COM2 support multi-protocols include RS232, RS422 and RS485, while COM3, COM4. COM5 and COM6 support diffused RS232 protocol.
The Protocols of COM2 can be set up through jumpers.
COM2MODE: COM2 Protocols selection.
The pin-out for each mode is illustrated on next chapter.

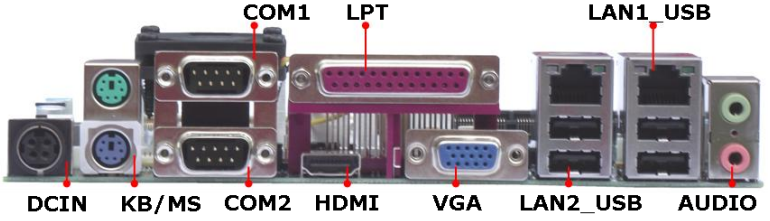
COM2MODE1	I/F TYPE
2 18  1 17	RS-232
2 18  1 17	RS-422
2 18  1 17	RS-485

2.2 Connectors on the EMB-M7

The connector on the EMB-M7 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers and etc. The following table lists the connectors on EMB-M7 and their respective page number.

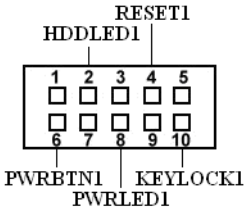
Connector Locations on the EMB-M7





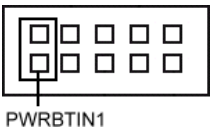
Front Panel Connector

The front panel of the case has a control panel, which provides light indication of the computer activities and switches to change the computer status.



- **ATX Power ON/OFF Button**

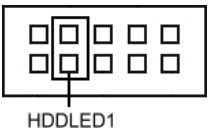
This 2-pin connector acts as the "Power Supply On/Off Switch" on the EMB-M7 main board. When pressed, the switch will force the Main board to power on. When pressed again, it will force the main board to power off.



PWR BTN Pin #	Signal Name
1	PWR-BTN
6	GND

- **HDD LED Connector**

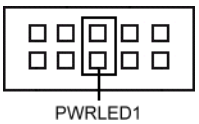
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



HDD LED Pin #	Signal Name
2	VCC
7	HDDLED

- **Power-On LED**

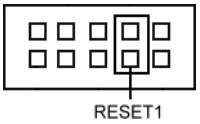
This connector allows users to connect to Front Panel Power indicator.



Power-On Pin #	Signal Name
3	VCC
8	GND

➢ **RESET Switch**

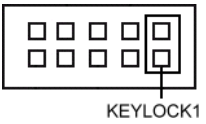
The reset switch allows the user to reset the system without turning the main power switch off and then on. Orientation is not required when making a connection to this header.



RESET Pin #	Signal Name
4	Reset
9	GND

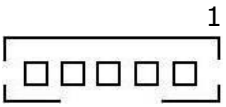
➢ **KEYLOCK Switch**

The keylock switch, when closed, will disable the keyboard function.



KEYLOCK Pin #	Signal Name
5	KEYLOCK
10	GND

BACKLIGHT Connector



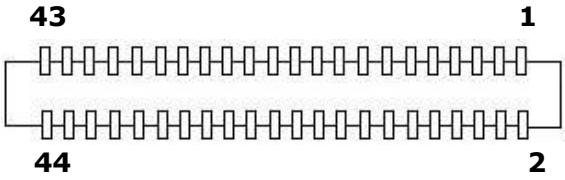
Pin #	Signal Name
1	+12V
2	GND
3	Brightness
4	ON/OFF
5	GND

IRDA Connector

This connector is used for an IRDA connector for wireless communication.

IrDA Pin #	Signal Name
1	+5V
2	FIR
3	IR-TX
4	GND
5	IR-RX

IDE Connectors

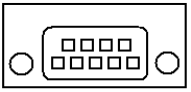


Primary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host PU 0
DACK	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	P66DET
Address 0	35	36	Address 2
Chip select 1	37	38	Chip select 3
Activity LED	39	40	GND
VCC	41	42	VCC
GND	43	44	NC

COM1 Serial Port

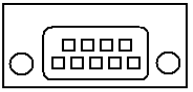
COM1, a 9-pin D-Sub male connector, is the onboard COM1 serial port of the EMB-M7. The following table shows its pin assignments.



Pin #	Signal Name
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	+5V,Ring-IN or +12V

COM2 Serial Port

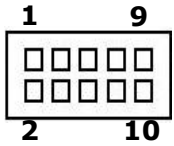
COM2, a 9-pin D-Sub male connector, is the onboard COM2 serial port of the EMB-M7. The following table shows its pin assignments.



Pin #	RS232 Mode Signal Name	RS422/RS485 Mode Signal Name
1	DCD, Data carrier detect	TX- (422/485)
2	RXD, Receive data	TX+ (422/485)
3	TXD, Transmit data	RX+ (422)
4	DTR, Data terminal ready	RX- (422)
5	GND, ground	GND
6	DSR, Data set ready	N.C.
7	RTS, Request to send	N.C.
8	CTS, Clear to send	N.C.
9	+5V,Ring-IN or +12V	N.C.

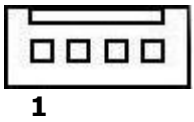
COM3, COM4, COM5,COM6 Serial Ports

COM3, COM4, COM5, COM6 a 10-pin header connector, is the onboard COM3, COM4, COM5, COM6 serial port of the EMB-M7. The following table shows its pin assignments.



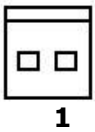
Pin #	RS232 Mode Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	Ring-IN
10	NC

PWROUT1 Connector



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

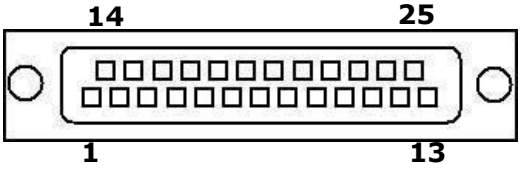
PWROUT2 Connector



Pin #	Signal Name
1	VCC
2	GND

LPT Port

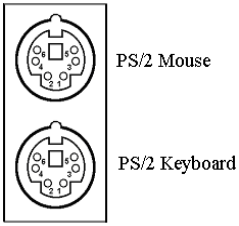
The LPT parallel port is a standard DSUB 25-pins Female connector. It can be configured as EPP or ECP or SPP mode.



Signal Name	Pin #	Pin #	Signal Name
Strobe	1	14	AUTOFD
DATA0	2	15	ERROR
DATA1	3	16	INIT
DATA2	4	17	SLIN
DATA3	5	18	GND
DATA4	6	19	GND
DATA5	7	20	GND
DATA6	8	21	GND
DATA7	9	22	GND
ACK	10	23	GND
BUSY	11	24	GND
PE	12	25	GND
SLCT	13		

PS/2 Keyboard & Mouse Connector

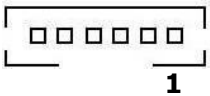
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector.



Pin #	Signal Name
1	Keyboard/Mouse data
2	NC
3	GND
4	5V
5	Keyboard/Mouse clock
6	GND

PS2KBMS Connector

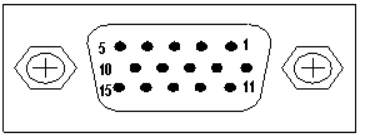
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector with 6-pins wafer for internal or external access.



Pin #	Signal Name
1	RKBCLK
2	RKBDAT
3	RMSCLK
4	RMSDAT
5	RKBVCC
6	KBGND

VGA Connector

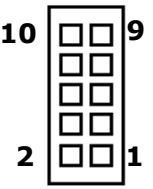
The pin assignments of VGA CRT connector are as follows:



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	DDC_DATA
HSYNC	13	14	VSYNC
DDC_CLK	15		

VGA1 Connector

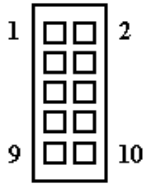
INT_VGA is for internal Video A/D board connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
RED	1	2	GND
GREEN	3	4	GND
BLUE	5	6	GND
HSYNC	7	8	DDC_DATA
VSYNC	9	10	DDC_CLK

VGA2 Connector

INT_VGA is for internal Video A/D board connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
RED	1	2	GND
GREEN	3	4	GND
BLUE	5	6	GND
HSYNC	7	8	DDC_DATA
VSYNC	9	10	DDC_CLK

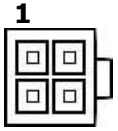
DCIN Connector

DC_IN1 is for external power input connection to supply system power. It needs to be +12V input from AC/DC adapter within 5% tolerance.
Users should calculate the total system power required and use sufficient rating adapter.

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

DCIN2 Power Connector

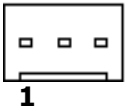
The CD_IN2 power connector is for internal connection to +12V input power. If you already have external +12V power input connected on DC_IN1, please leave DC_IN2 unconnected.



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

CPU Fan Power Connector

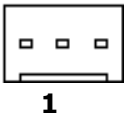
This is a 3-pin header for the CPU fan.



Pin #	Signal Name
1	Ground
2	+12V
3	CPUPWM

FAN1 Power Connector

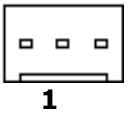
This is a 3-pin header for the system fan.



Pin #	Signal Name
1	Ground
2	+12V
3	SYSPWM

FAN2 Power Connector

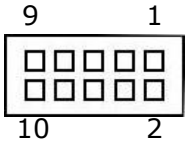
This is a 3-pin header for the system fan.



Pin #	Signal Name
1	Ground
2	+12V
3	SYSPWM

USB12 USB34 Connectors

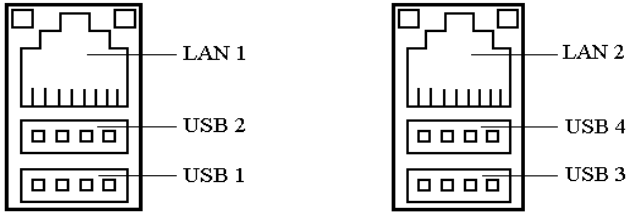
The following table shows the pin outs of the USB56 USB78 connectors.



USB5,USB6 USB7,USB8 Pin#		Signal Name
10	1	N.C.
2	9	+5V
8	3	Ground
4	7	USB-
6	5	USB+

LANGbE+USBx2 Connectors

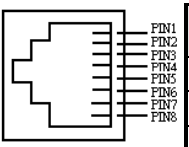
Below pictures show the location of LAN GbE ports and USB Type-A ports on the Combo GbE + USB connector.



Before you connect your device(s) into USB connector(s), please make sure your device(s) such as USB keyboard, mouse, scanner, zip, speaker and etc., Have a standard USB interface. Also make sure your OS supports USB controller.
If you're OS does not support USB controller, please contact OS vendor for possible patch or driver upgrade. For more information please contact your OS or device(s) vendors.

LAN- GBE Connectors

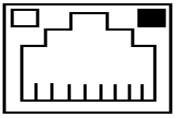
This connector is for the 10/100/1000Mbps Ethernet capability. The figure below shows the pin out assignments of this connector and its corresponding input jack.



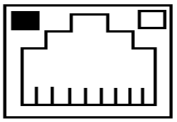
Pin #	Signal Name
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	MDI2-
7	MDI3+
8	MDI3-

LAN RJ45 LED1, 2

The LAN_LEDs on top of RJ45 are to display the current network connection status. The green color LED on the right-hand side shows the link status and TX/RX activity. The Orange/Green Dual color LED on the left-hand side indicates the operation mode, i.e. 10Base-T, 100Base-T or 1000Base-T.



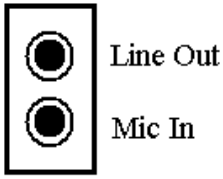
LNK/ACT	STATUS
YELLOW	Link
OFF	Disconnected
FLASH	Packets TX/RX



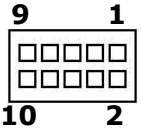
SPEED	MODE
ORANGE	1000 Mbps
GREEN	100 Mbps
OFF	10 Mbps

Audio Connectors

After install onboard audio driver, you may connect speaker to Line Out jack, microphone to MIC In jack.

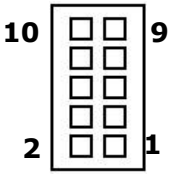


Audio1Pin Headers



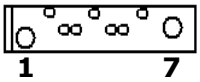
Signal Name	Pin #	Pin #	Signal Name
JD0	1	2	NC
MIC1-IN-L	3	4	MIC1-IN-R
GND	5	6	GND
LINEOUT-L	7	8	LINE-IN-L
LINEOUT-R	9	10	LINE-IN-R

Audio 2 Pin Headers



Signal Name	Pin #	Pin #	Signal Name
SPDIF_IN_RCA	1	2	SPDIF_IN_OPT
SPDIF_OUT_RCA	3	4	SPDIF_OUT_OPT
GND	5	6	GND
SURR_L	7	8	SURR_R
CENT	9	10	VCC

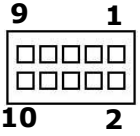
SATA1, SATA2, SATA3 Connectors



Pin #	Signal Name
1	GND
2	SATATX+
3	SATATX-
4	GND
5	SATARX-
6	SATARX+
7	GND

DIO Pin Header

DIO port supports 8 digital I/O bits. Each bit can be configured as Input or output individually. All bits are 5V tolerant.



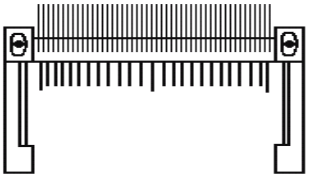
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	+5V
DIO_0	3	4	DIO_4
DIO_1	5	6	DIO_5
DIO_2	7	8	DIO_6
DIO_3	9	10	DIO_7

LVDS Connector

The LCD panel, inverter for LCD LAMP, Touch-screen Serial Interface must be connected to this LVDS header, using the below described connector:

Signal Name	Pin #	Pin #	Signal Name
+12V	2	1	+12V
GND	4	3	GND
LCDVDD 5V/3.3V	6	5	LCDVDD 5V/3.3V
GND	8	7	GND
BCKLITE_ON	10	9	BRIGHTNES
LVDS_GND	12	11	LVDS_GND
-	14	13	CHA_TX0+
-	16	15	CHA_TX0-
-	18	17	LVDS_GND
-	20	19	CHA_TX1+
-	22	21	CHA_TX1-
-	24	23	LVDS_GND
-	26	25	CHA_TX2+
-	28	27	CHA_TX2-
-	30	29	LVDS_GND
-	32	31	CHA_TXC+
-	34	33	CHA_TXC-
-	36	35	LVDS_GND
-	38	37	CHA_TX3+
-	40	39	CHA_TX3-

CF-II Connector



Signal Name	Pin #	Pin #	Signal Name
GND	1	2	PDD3
PDD4	3	4	PDD5
PDD6	5	6	PDD7
PCS1-	7	8	GND
GND	9	10	GND
GND	11	12	GND
VCC	13	14	GND
GND	15	16	GND
GND	17	18	PDA2
PDA1	19	20	PDA0
PDD0	21	22	PDD1
PDD2	23	24	N.C.
N.C.	25	26	N.C.
PDD11	27	28	PDD12
PDD13	29	30	PDD14
PDD15	31	32	PCS3-
N.C.	33	34	PDIOR-
PDIOW-	35	36	VCC
IRQ14	37	38	VCC
MST#_SLV	39	40	N.C.
PST1-	41	42	PIORDY
PDDREQ	43	44	PDDACK-
CF_LED-	45	46	N.C.
PDD8	47	48	PDD9
PDD10	49	50	GND

Chapter 3 BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the EMB-M7 CPU card. The topics covered in this chapter are as follows:

BIOS Introduction

This Chapter discusses Award™ Setup program built into the EMB-M7 BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The AwardBIOS™ installed in EMB-M7 is a custom version of an industry standard BIOS. This means that it supports Intel Core 2 Duo in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

It also adds non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you
do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Navigating through the menu bar
Use the left and right arrow keys to choose the menu you want to be in.

To display a sub menu
Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

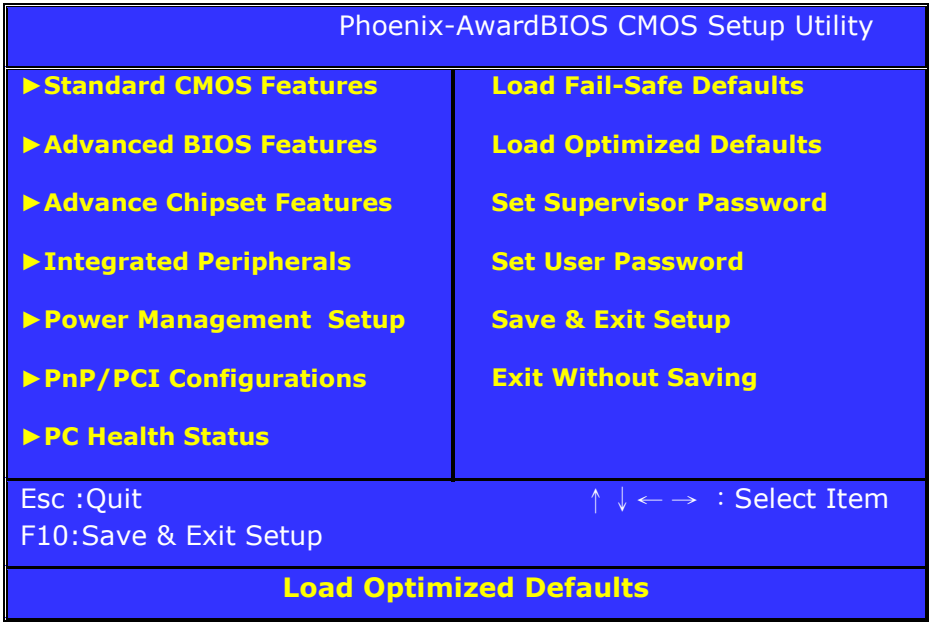
Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.
The best advice is to only alter settings that you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and EMB-M7 manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.1 Main Menu



(Figure 1)

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories.

➢Standard CMOS Features

Use this menu for basic system configuration.

➢ Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

➢ Advance Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

➢ Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

➢ Power Management Setup

Use this menu to specify your settings for power management.

➢ PnP/PCI Configurations

Use this menu to set up the PnP/PCI configuration.

➢ PC Health Status

Use this menu to display the CPU temperature, FAN speed and voltages.

➢ Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

➢ Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

➢ Set Supervisor/ User Password

Use this menu to set User and Supervisor Passwords.

➢ Save & Exit Setup

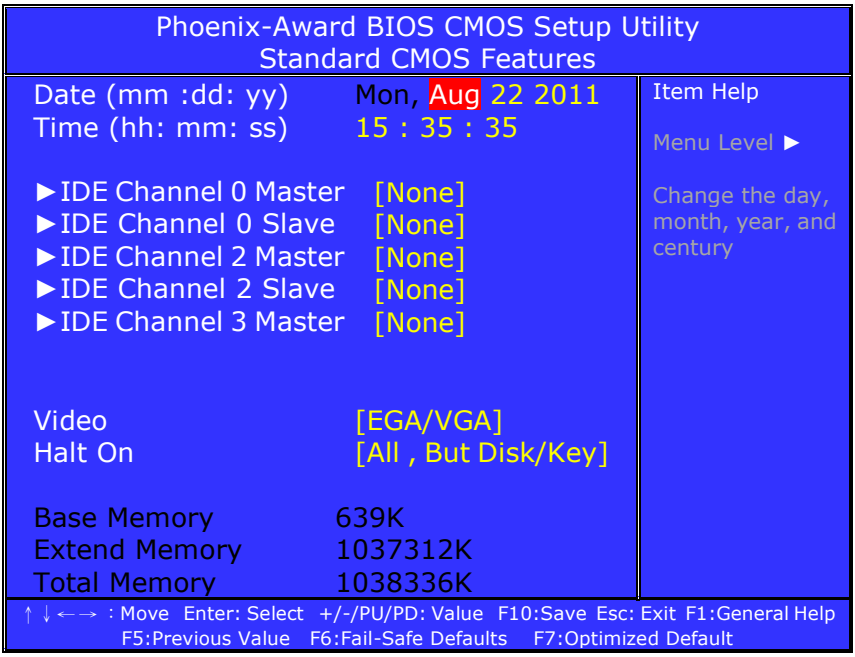
Save CMOS value changes to CMOS and exit setup.

➢ Exit Without Saving

Abandon all CMOS value changes and exit setup.

3.2 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <Pg Dn> keys to select the value you want in each item.



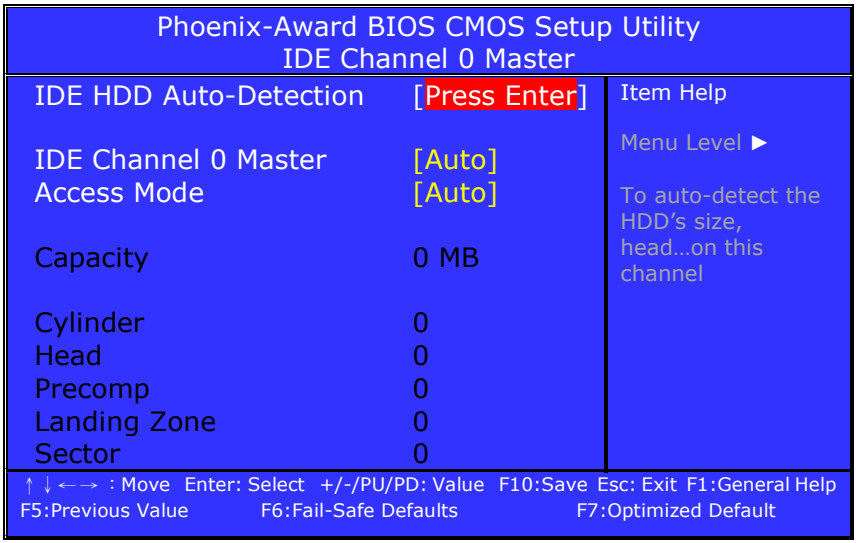
(Figure 2)

This table shows the selections that you can make on the Standard CMOS Menu

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Channel 0, 1 Master/ Slave

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. Figure 3 shows the IDE Channel 0 / Channel 1 master sub menu.



(Figure 3)

Use the legend keys to navigate through this menu and exit to the main menu. Use the Table listed below to configure the hard disk**.**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE!
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Channel 0 Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA: For EGA, VGA, SEGA, SVGA or PGA monitor adapters **(default).**

CGA 40: Power up in 40 column mode.

CGA 80: Power up in 80 column mode.

MONO: For Hercules or MDA adapters.

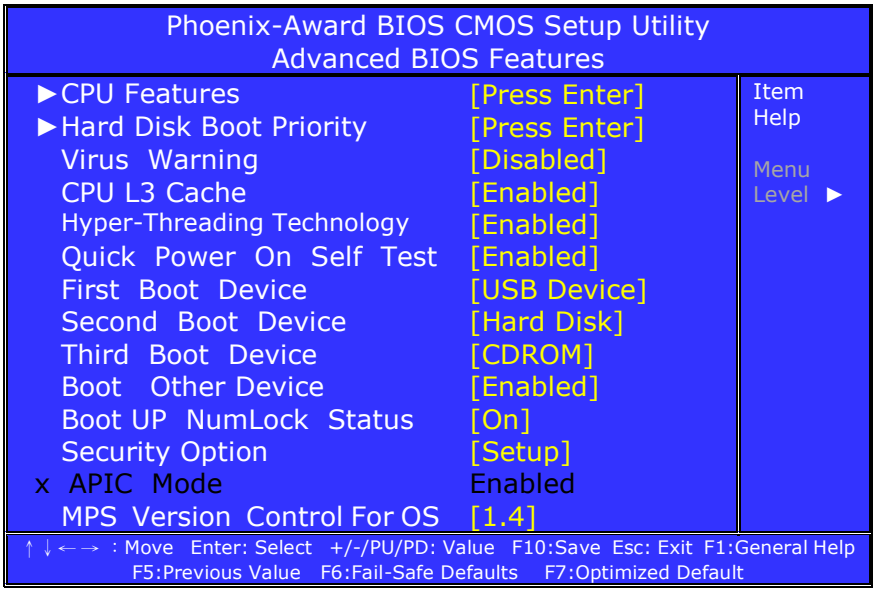
Halt On

This field determines whether the system will halt if an error is detected during power up.

All errors	Whenever the BIOS detect a non-fatal error, the system will stop and you will be prompted.
No errors	The system boot will not be halted for any error that may be detected.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors **(default).**
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a key- board or disk error; it will stop for all others.

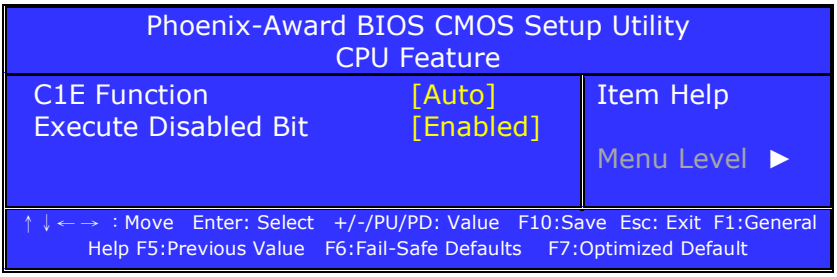
3.3 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



(Figure 4)

➢CPU Feature



(Figure 5)

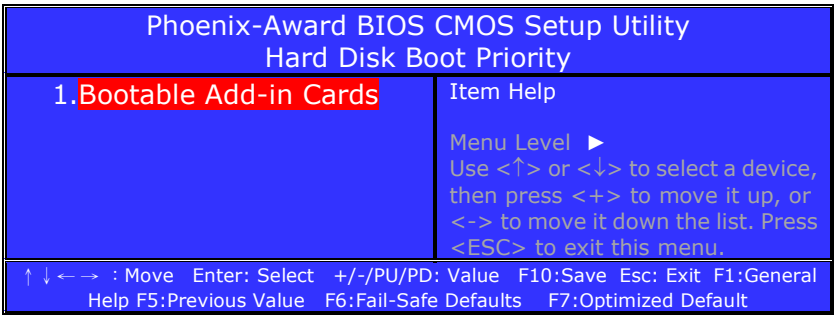
C1E Function

The choice: Auto **(default)**, Disabled

Execute Disabled Bit

The choice: Enabled **(default)**, Disabled

➢Hard Disk Boot Priority



(Figure 6)

Bootable Add-in Cards

This is for setting the priority of the hard disk boot order when the
"Hard Disk" option is selected in the "[First/Second/Third] Boot Device "menu item.

Virus Warning

Allow you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection.
If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table **(default).**

CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.
The choice: Enabled **(default)**, Disabled.

Hyper-Threading Technology

The choice: Enabled **(default)**, Disabled.

Quick Power On Self Test

Allow the system to skip certain tests while booting.
This will decrease the time needed to boot the system.

Enabled	Enable quick POST **(default).**
Disabled	Normal POST

First/Second/Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
The Choice: Floppy, LS120, Hard-Disk, ZIP100, CDROM, Disabled, USB-FDD, USB-ZIP, USB-CDROM, Legacy LAN.

Item	**Default**
First Boot Device	USB Device
Second Boot Device	Hard Disk
Third Boot Device	CDROM

Boot Other Device

When enabled, BIOS will try to load the operating system from other device when it failed to load from the three devices above.
The choice: Enabled **(default)**, Disabled.

Boot Up NumLock Status

Selects power on state for Num Lock.
The choice: On **(default)**, Off.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled, Disabled **(default)**.

If Typematic Rate setting is [Enabled]
Can choice Rate and Delay:

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt **(default).**

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

APIC Mode

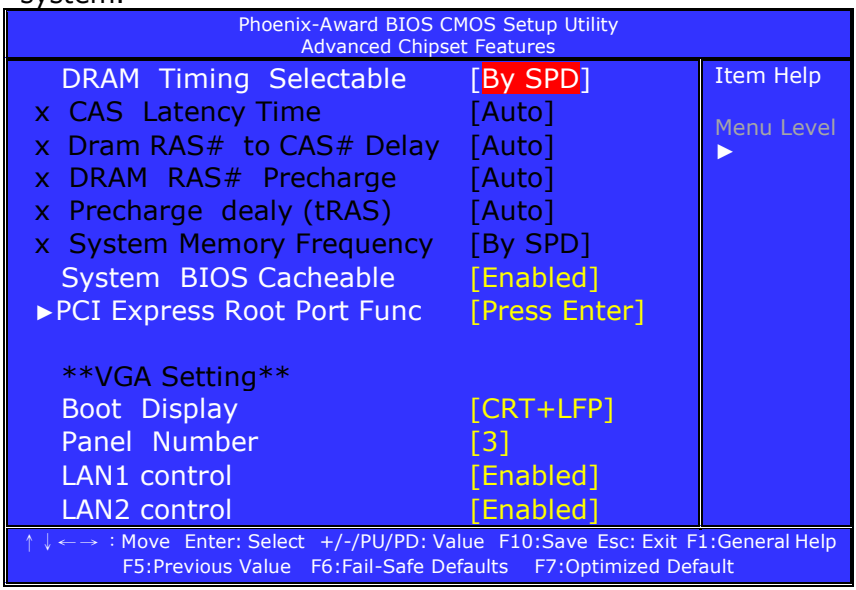
This setting allows to enable the APIC mode.
The choice: Enabled **(default)**, Disabled.

MPS Version Control For OS

The BIOS supports version 1.1 and 1.4 of the Intel multiprocessor specification.
Select version supported by the operation system running on this computer.
The choice: 1.1, 1.4 **(default)**.

3.4 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.



(Figure 7)

DRAM Timing Selectable

The choice: Manual, By SPD **(default)**.

If DRAM Timing Selectable is [Manual], can choice these Items:

►CAS Latency Time
►Dram RAS# to CAS# Delay
►DRAM RAS# Precharge
►Precharge dealy (tRAS)
►System Memory Frequency

CAS Latency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available.
Leave this on the default setting.
The choice: 5, 4, 3, 6, Auto **(default)**.

DRAM RAS# to CAS# Delay

In order to improve performance, certain space in memory is reserved for PISA cards.
This memory must be mapped into the memory space below 16MB.
The choice: 2, 3, 4, 5, 6, Auto **(default)**.

DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to DRAM.
Leave this on the default setting.
The choice: Auto **(default)**, 2, 3,4,5,6.

Precharge dealy (tRAS)

The choice: Auto **(default)**,
4,5,6,7,8,9,10,11,12,13,14,15.

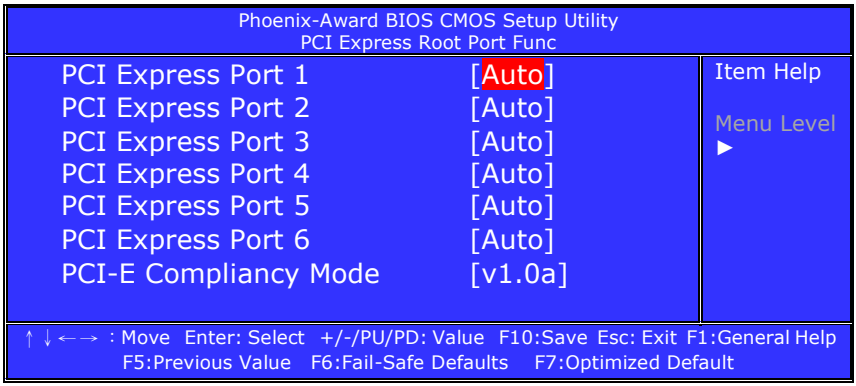
System Memory Frequency

The choice: By SPD **(default)**, 667MHz, 800MHz

System BIOS Cacheable

Selecting the "Enabled" option allows caching of the system BIOS ROM at F0000h-FFFFFh, which is able to improve the system performance. However, any programs that attempts to write to this memory block will cause conflicts and result in system errors.
The choice: Enabled (**default)**, Disabled.

▸PCI Express Root Port Func



PCI Express Port 1~6

The choice: Enabled, Disabled, Auto **(default).**

PCI-E Compliancy Mode

The choice: v1.0a, v1.0 **(default).**

Boot Display

This field is used to select the type of display to use when the system boots.
The choice:

Auto	CRT	TV	EFP
LFP	CRT+LFP **(default)**	EFP+LFP	

Panel Number

The choice: 1,2,3 **(default)**,4,5,6,7,8,9,10,11,12,13,14,15,16.

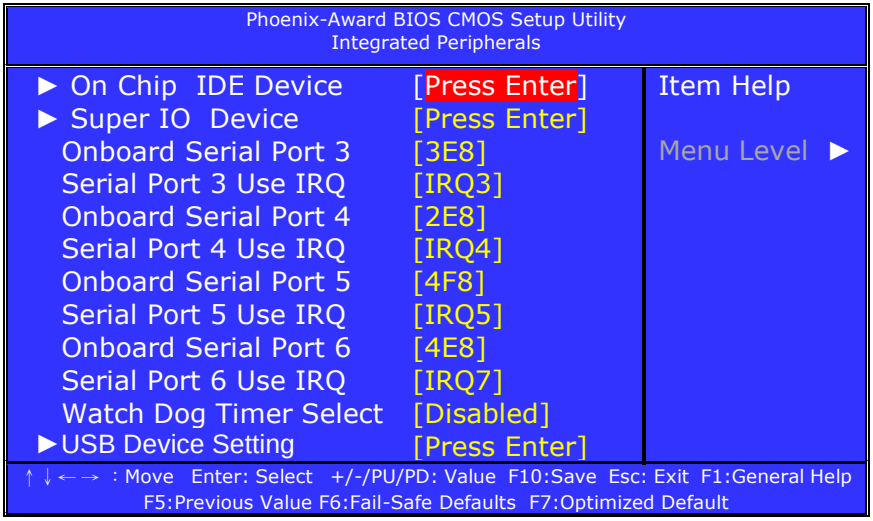
Lan1 Chip Control

The choice: Enabled **(default)**, Disabled.

Lan2 Chip Control

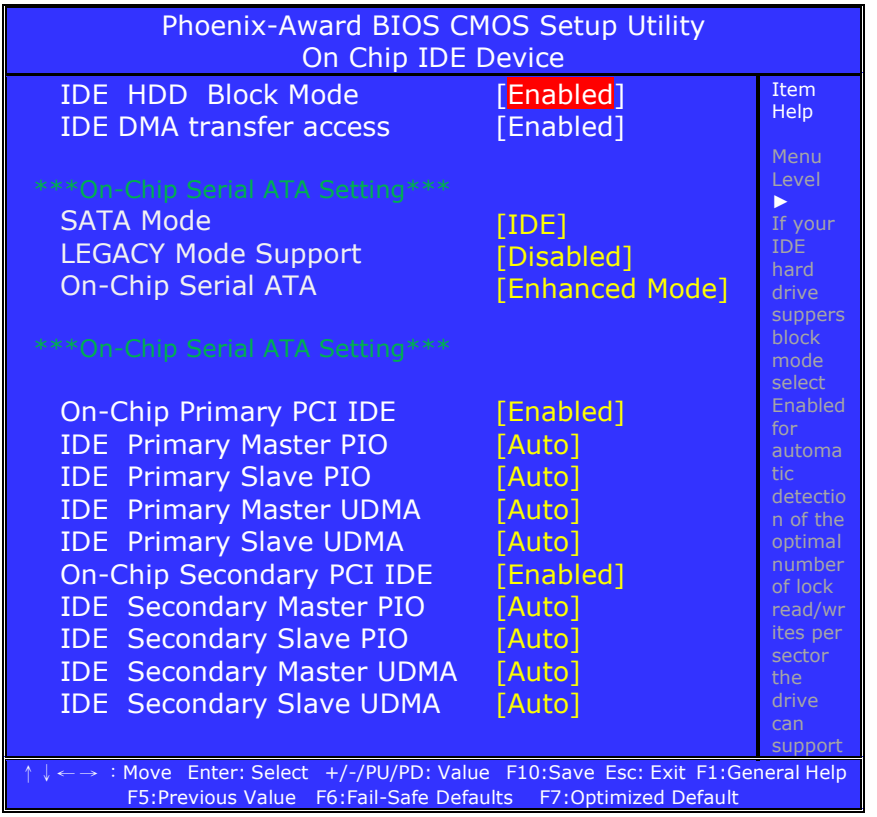
The choice: Enabled **(default)**, Disabled.

3.5 Integrated Peripherals



(Figure 8)

➢On Chip IDE Device



(Figure 9)

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sectors read / write.

If you're IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block mode (most new drives do), select.

Enabled for automatic detection of the optimal number of block read /write per sector where the drive can support.

The choice: Enabled **(default)**, Disabled.

IDE DMA transfer access

The choice: Enabled **(default)**, Disabled.

SATA Mode

The choice: IDE **(default)**, RAID, AHCI.

LEGACY Mode Support

The choice: Enabled, Disabled **(default)**.

On-Chip Serial ATA

The choice: Disabled, Combined Mode, Enhanced Mode **(default)**, and SATA Only.

On-Chip Primary PCI IDE

This field allows you to enable or disable the primary and secondary IDE controller.
Select disabled if you want to add a different hard drive controller.
The choice: Enabled **(default)**, Disabled.

IDE Primary/Secondary, Master/Slave PIO

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

Caution: Do not use the wrong setting or you will have drive errors.

PIO means Programmed Input/output.
Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them.

Your system supports five modes, 0 (default) to 4, which primarily differ in timing.
When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto	The BIOS will automatically set the system according to your hard disk drive's timing **(default)**.
Mode 0-4	You can select a mode that matches your hard disk drive's timing.

IDE Primary/Secondary, Master/ Slave UDMA

The choice: Disabled, Auto **(default).**

On-Chip Secondary PCI IDE

These fields allow you to enable or disable the primary and secondary IDE controller.
Select disabled if you want to add a different hard drive controller.
The choice: Enabled **(default)**, Disabled.

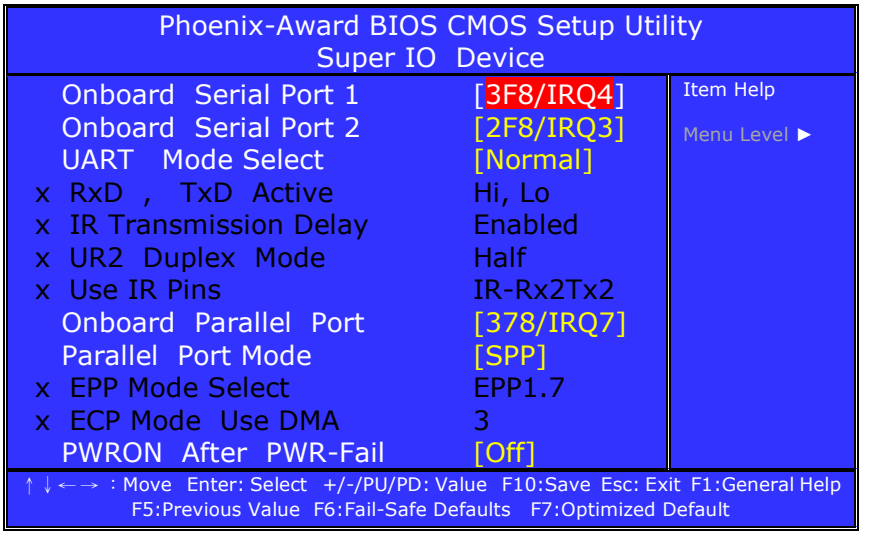
IDE Secondary Master/Slave PIO

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

IDE Secondary Master/Slave UDMA

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

➢Super IO Device



Onboard Serial Port 1

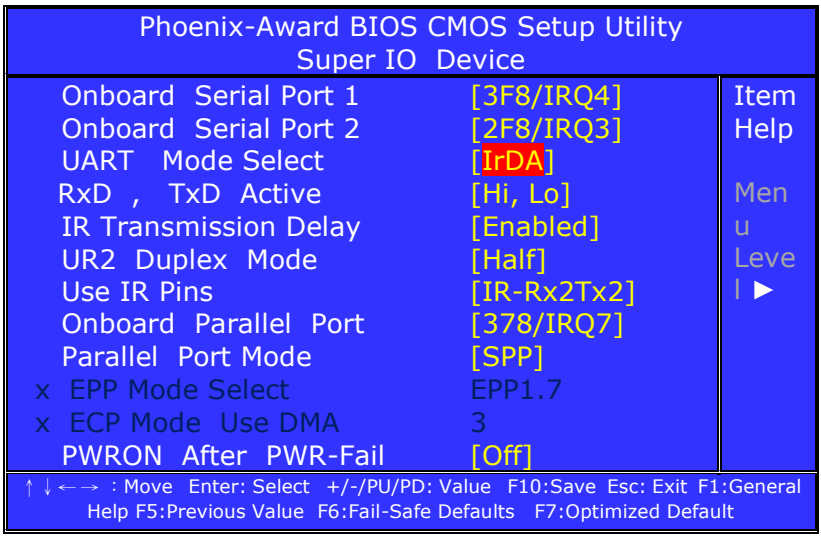
Select an address and corresponding interrupt for the first serial ports.
The choice: Disable, 3F8/IRQ4 **(default)**, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

Onboard Serial Port 2

Select an address and corresponding interrupt for the second serial ports.
The choice: Disable, 3F8/IRQ4, 2F8/IRQ3 **(default)**, 3E8/IRQ4, 2E8/IRQ3, Auto.

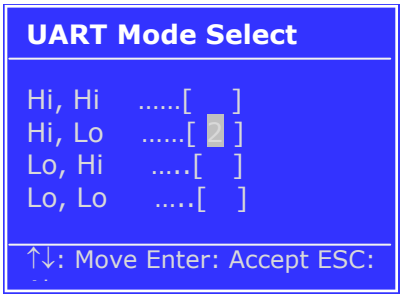
UART Mode Select

This item allows you to select which mode for the Onboard Serial Port 2.
The choice: IrDA, ASKIR, Normal **(default).**
If UART Mode Select is [IrDA] and [ASKIR] will show:



RxD, TxD Active

The choice:



IR Transmission Delay

The choice: Disabled, Enabled **(default)**.

UR2 Duplex Mode

The choice: Full, Half **(default)**.

Onboard Parallel Port

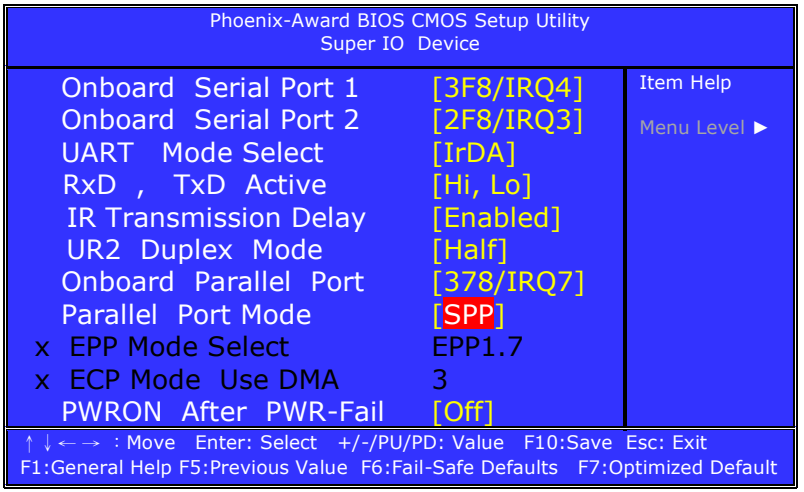
This item allows you to determine onboard parallel port controller I/O address setting.
The choice: 378/IRQ7 **(default)**, 278/IRQ5, 3BC/IRQ7, Disabled.

Parallel Port Mode

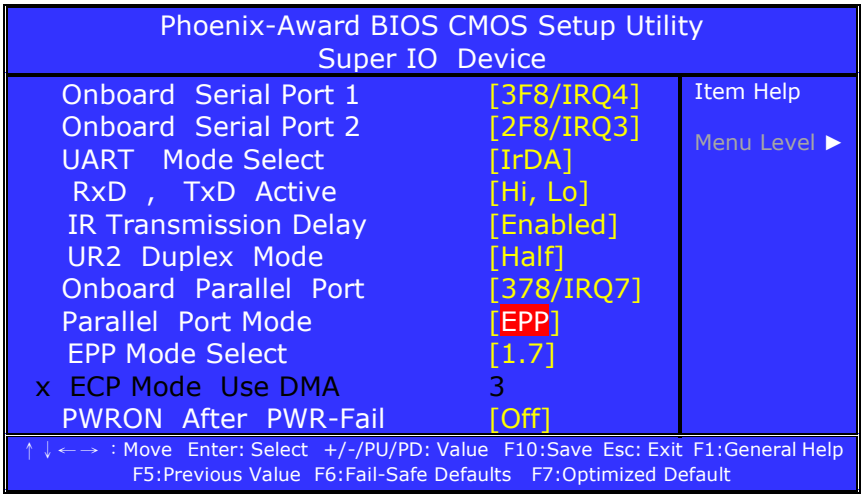
The choice: SPP **(default)**, EPP, ECP, ECP+EPP, Normal.

SPP	Sets the parallel port to function as a Standard Parallel Port. This is the default (and slowest) option.
EPP	Sets the parallel port to Enhanced Parallel Port mode. Sometimes also called "Bi-directional"
ECP	Sets the parallel port up as an Enhanced Capabilities Port. This setting requires the use of a DMA channel

If Parallel Port Mode Select is [SPP] and [Normal] will show:



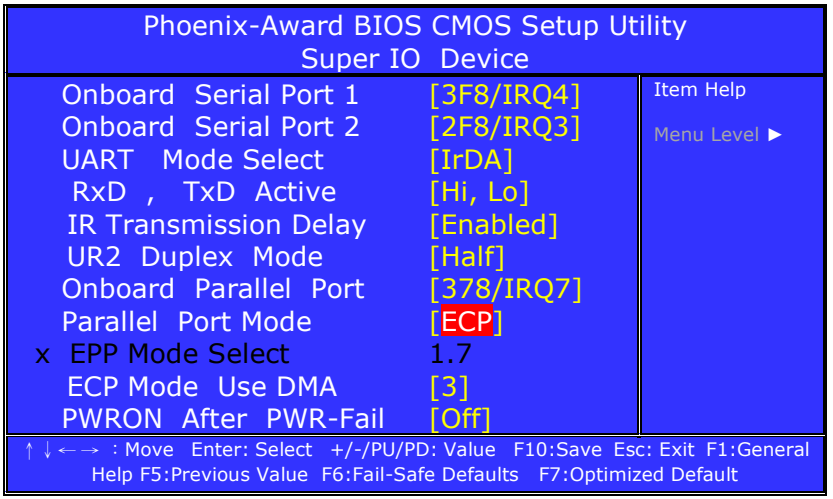
If Parallel Port Mode Select is [EPP] will show:



EPP Mode Select

Select EPP port type 1.7 or 1.9.
The choice: EPP1.7 **(default)**, EPP1.9.

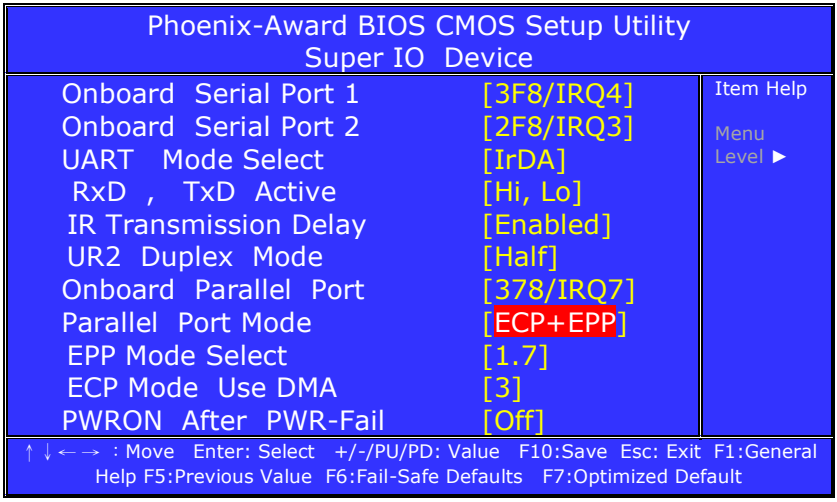
If Parallel Port Mode Select is [ECP] will show:



ECP Mode Use DMA

If your system supports ECP parallel port mode and you have the port set to use ECP, you must use this setting to assign a DMA channel for use by the port.
The choice: 1, 3 **(default)**.

If Parallel Port Mode Select is [ECP+EPP] will show:



EPP Mode Select

Select EPP port type 1.7 or 1.9.
The choice: 1.7 **(default)**, 1.9.

ECP Mode Use DMA

If your system supports ECP parallel port mode and you have the port set to use ECP, you must use this setting to assign a DMA channel for use by the port.
The choice: DMA1, DMA3 **(default)**.

PWRON After PWR-Fail

When power fails, you can select power ON or Off or Former status.
The choice: Off **(default)**, On, Former-Sts.

Onboard Serial Port 3

This is used to select an I/O address for the onboard serial port 3.
The choice: Disabled, 3F8, 2F8, 3E8 **(default)**, 2E8.

Serial Port 3 Use IRQ

This is used to select an IRQ for the onboard serial port 3.
The choice: IRQ3, IRQ4, IRQ5 **(default),** IRQ6, IRQ7, IRQ10, IRQ11.

Onboard Serial Port 4

This is used to select an I/O address for the onboard serial port 4.
The choice: Disabled, 3F8, 2F8, 3E8, 2E8 **(default).**

Serial Port 4 Use IRQ

This is used to select an IRQ for the onboard serial port 4.
The choice: IRQ3, IRQ4, IRQ5, IRQ6 **(default)**, IRQ7, IRQ10, IRQ11.

Onboard Serial Port 5

This is used to select an I/O address for the onboard serial port 5
The choice: Disabled, 4F8 **(default)**, 4E8**.**

Serial Port 5 Use IRQ

This is used to select an IRQ for the onboard serial port 5.
The choice: IRQ3, IRQ4, IRQ5, IRQ6, IRQ7 **(default)**, IRQ10, IRQ11.

Onboard Serial Port 6

This is used to select an I/O address for the onboard serial port 6.
The choice: Disabled, 4F8, 4E8 **(default).**

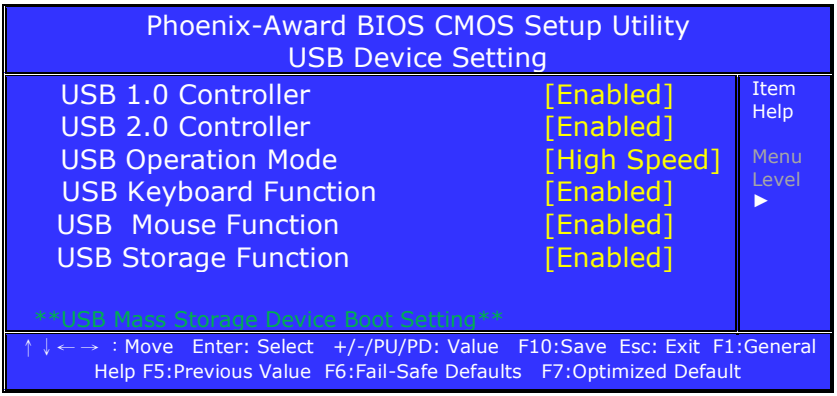
Serial Port 6 Use IRQ

This is used to select an IRQ for the onboard serial port 6. The choice: IRQ3, IRQ4, IRQ5, IRQ6, IRQ7, IRQ10 **(default)**, IRQ11.

Watch Dog Timer Select

The choice: Disabled **(default)**, Enable.

►USB Device Setting



USB 1.0 Controller

The choice: Disabled, Enable **(default).**

USB 2.0 Controller

The choice: Disabled, Enable **(default).**

USB Operation Mode

The choice: Full/Low Speed, High Speed **(default).**

USB Keyboard Function

The choice: Disabled, Enable **(default).**

USB Mouse Function

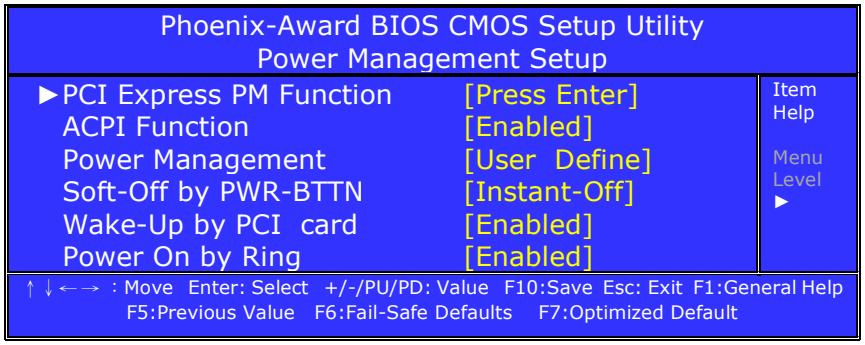
The choice: Disabled, Enable **(default).**

USB Storage Function

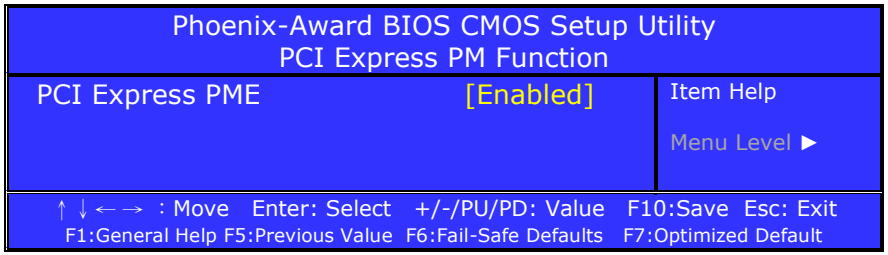
The choice: Disabled, Enable **(default).**

3.6 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.



►PCI Express PM Function



PCI Express PME

The choice: Enabled **(default)**, Disabled.

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).
The choice: Enabled **(default)**, Disabled.

Power Management

The choice: User Define **(default)**, Min Saving, Max Saving.

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the section for each mode, below.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

8Min, 9Min, 10Min, 11Min, 12Min, 13Min, 14Min, 15Min, Disable **(default)**.

Soft-Off by PWR-BTTN

This field defines the power off mode when using an ATX power supply.
The choice: Instant-Off, Delay 4 Sec.

Instant-Off	Press power button then Power off instantly **(default).**
Delay 4 Sec	Press power button 4 sec. to Power off. Enter suspend if button is pressed less than 4 sec.

Wake-Up by PCI card

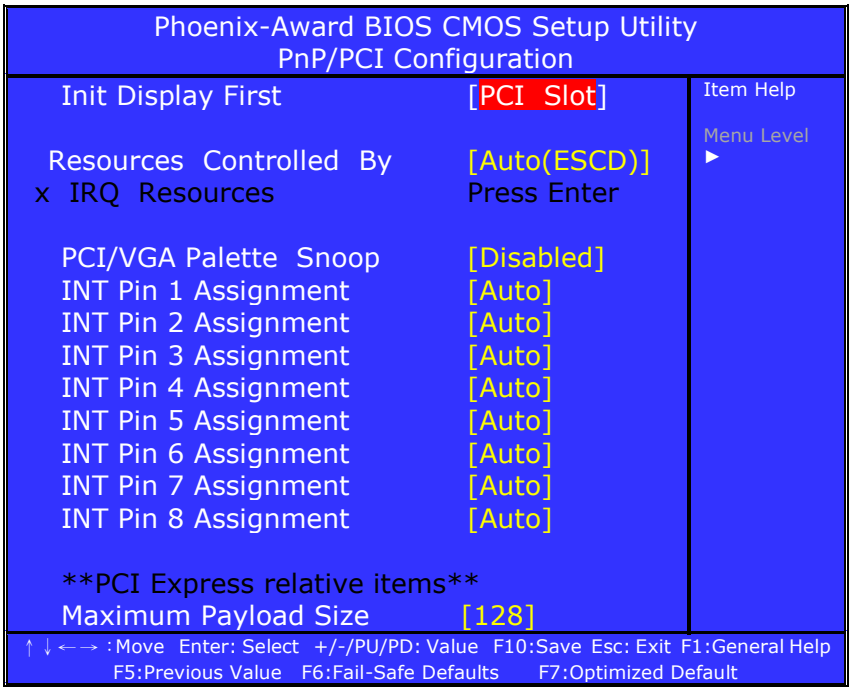
Enable/Disable PCI PME wakes up function.
The choice: Enabled **(default)**, Disabled.

Power On by Ring

Enable/Disable Power On By Ring function.
The choice: Enabled, Disabled **(default)**.

3.7 PnP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



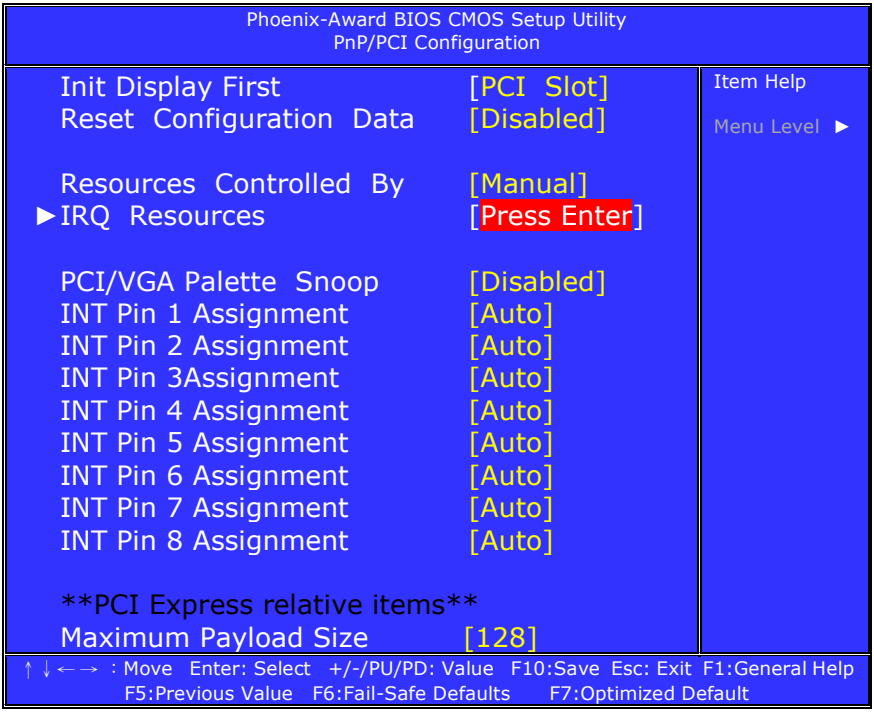
Init Display First

This item allows you to choose which one to activate first, PCI Slot or onchip VGA.
The choice: PCI Slot **(default)**, Onboard, PCIEx.

Resources Controlled By

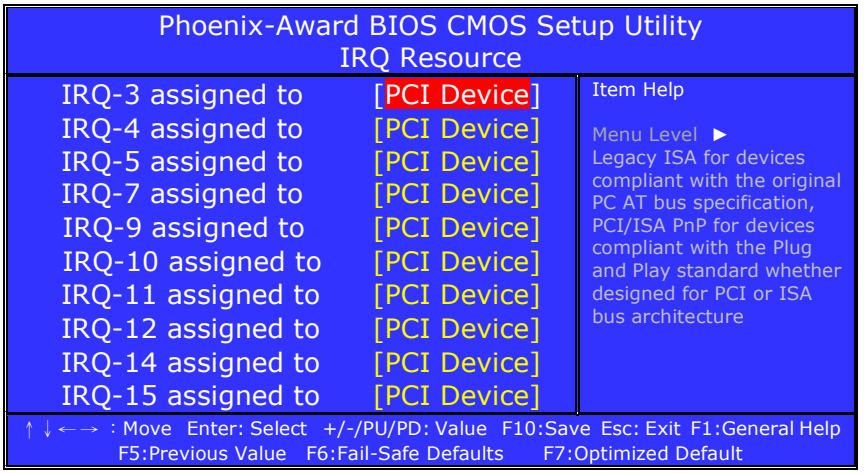
BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.
The choice: Auto (ESCD) **(default)**, Manual.

If Resources Controlled By is [Manual], can choice IRQ Resource:

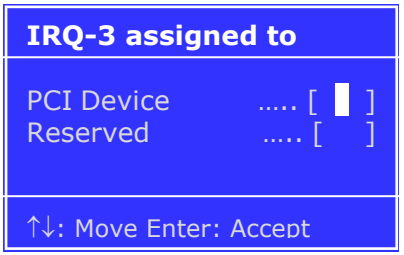


►IRQ Resource

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot.



IRQ-3,4,5,7,9,10,11,12,14,15 assigned to



The choice: PCI Device **(default)**, Reserved.

PCI/VGA Palette Snoop

This BIOS feature determines if your graphics card should allow VGA palette snooping by a fixed function display card.
The choice: Enabled, Disabled **(default).**

INT Pin 1/2/3/4/5/6/7/8 Assignment

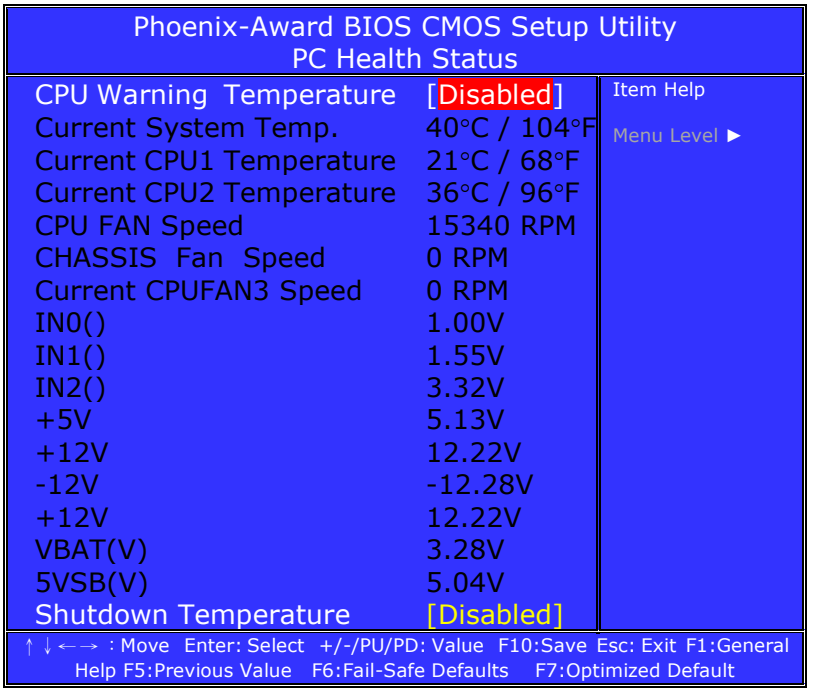
The choice: Auto **(default)**,3,4,5,7,9,10,11,12,14,15.

Maximum Payload Size

The choice: 128 (**default)**.

3.8 PC Health Status

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact with your motherboard supplier to get proper value about your setting of the CPU temperature.



CPU Warning Temperature

Select the CPU over-heated warning temperature.
The choice: Disabled **(default)**, 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F, 70°C/158°F.

Current System Temp

Show System Temperature.

Current CPU1/2 Temperature

Shows Board Temperature

CPU FAN Speed

Shows CPU Fan speed.

CHASSIS Fan Speed

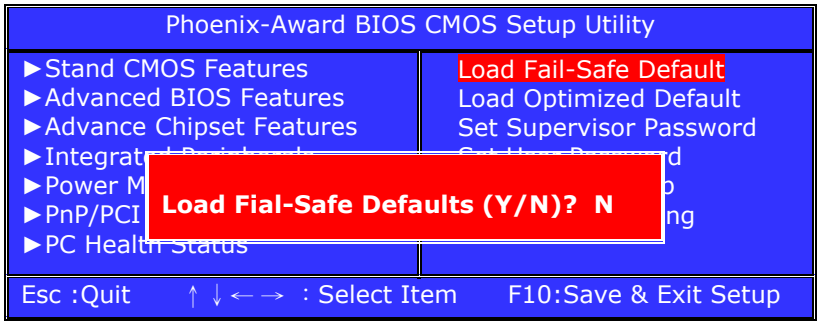
Shows CHASSIS Fan speed

Shutdown Temperature

Select the CPU over-heated shutdown temperature. The choice: Disabled **(default)**, 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F

3.9 Load Fail-Safe Defaults

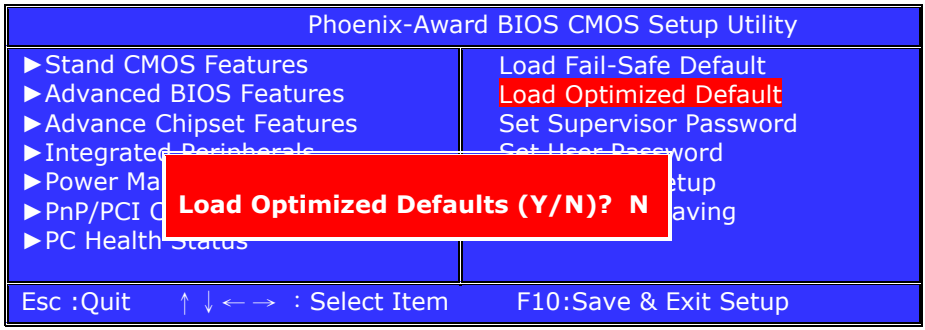
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:



Pressing '**Y**' loads the BIOS default values for the most stable, minimal-performance system operations.

3.10 Load Optimized Defaults

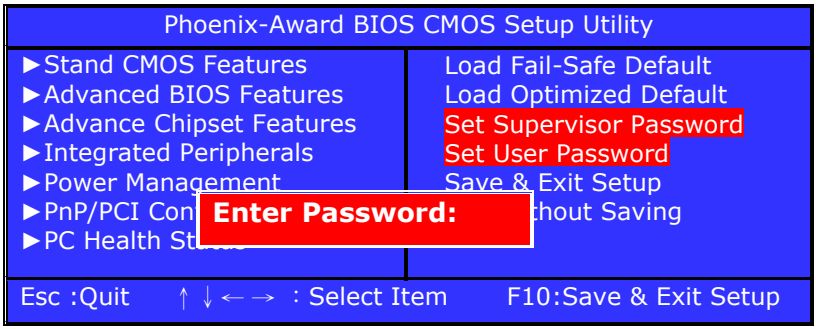
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:



Pressing '**Y**' loads the default values that are factory settings for optimal performance system operations.

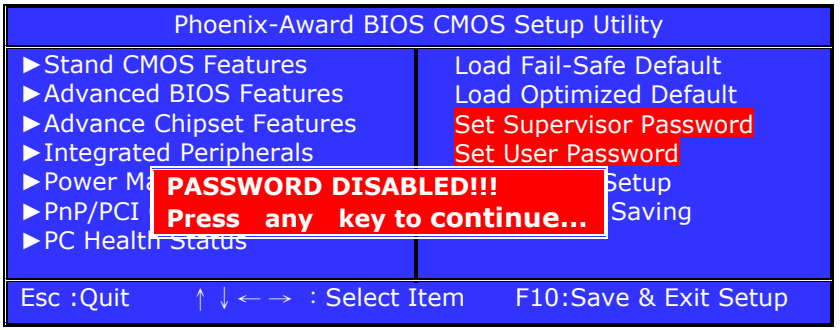
3.11 Set Supervisor/User Password

You can set either supervisor or user password, or both of them. The differences between are:
Supervisor password: can enter and change the options of the setup menus.
User password: just can only enter but do not have the right to change the options of the setup menus. 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 the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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



PASSWORD DISABLED:

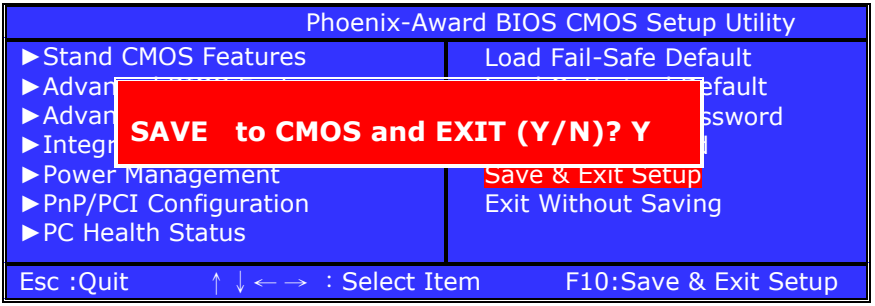
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

3.12 Save & Exit Setup

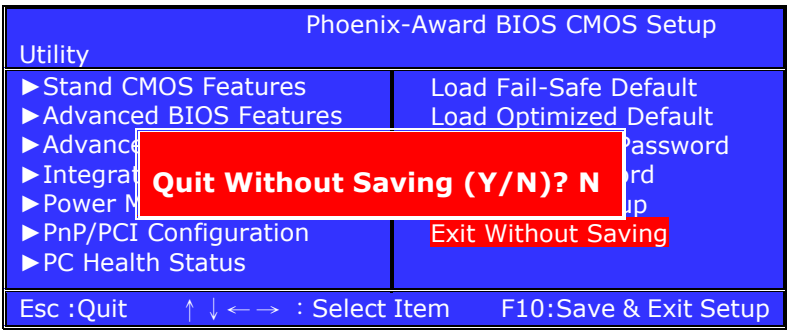
Pressing <Enter> on this item asks for confirmation:



Pressing "**Y**" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

3.13 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:



This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

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CHAPTER 4 Appendixes

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. POST Beep

Currently there are two kinds of beep codes in BIOS.
This code indicates that a **video error** has occurred and the BIOS cannot initialize the video screen to display any additional information.

This beep code consists of a single long beep followed by two short beeps.

The other code indicates that your **DRAM error** has occurred.
This beep code consists of a single long beep repeatedly.