rBOX111-FL Series

Robust Din-rail Fanless Embedded System

User's Manual

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Safety Precautions

Before getting started, please read the following important safety precautions.

1. The rBOX111-FL does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the rBOX111-FL before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the rBOX111-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -45℃ or above 85℃. It may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
   - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
   - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IP30
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

***Note: We strongly recommended that you should shut down the system before you start to clean any single components*.**

Please follow the steps below:

1. Close all application programs
2. Close operating software
3. Turn off power
4. Remove all device
5. Pull out power cable

Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

Trademarks Acknowledgments

Table of Contents

CHAPTER 1
INTRODUCTION

This chapter contains general information and detailed specifications of the rBOX111-FL. The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets
- Package List

1.1 General Description

The rBOX111-FL Din-rail fanless embedded systems are suitable for communications control and for protocol converter applications in critical environments. Built for rugged work environments, the rBOX111-FL series features an extra low power consumption Intel® ATOM™ Z510PT (1.1 GHz) or Z520PT (1.33 GHz) processors supporting industrial temperature range of -40℃ to +70℃. Their front accessible I/O cabling is very convenient for wiring and maintenance. The rBOX101-FL series offers a VGA output, making it particularly well-suited for communication control, SCADA and industrial automation. Its compact size with Din-rail mounting allows for easy installation into control cabinet. Pre-installed with Linux, Windows® CE 6.0. Windows® 7 embedded or Windows® XP embedded, the rBOX111-FL series provides programmers with a friendly environment for developing application software at a lower cost.

The rBOX111-FL is robust industrial-grade hardware design and adopts the advanced cooling system, besides, supporting the CompactFlash™, which makes it especially suitable for field control & monitoring system solution for following markets:

- Utility Industries (Water; Energy; Chemical Plant; Mining…)
- Public Transportation Industries (Traffic/ Highway Control; Train/Bus Control …)
- Homeland Security (Weather Monitoring/Alarm System …)

➢ Features

1. Fanless and no internal cabling design
2. Wide temperature operation of -40℃ - +70℃
3. Supports 2 10/100/1000 Ethernets with Magnetic Isolation Protection
4. 4 Isolation COM Ports
5. 2 Watchdog Timers
6. LED Indicators (Power, Alarm, Ready/Active, COM (TXD,RXD))
7. Wireless (3G/GPRS)
8. SNMP V1/V2c
9. Support one 2.5" SATA SSD (or HDD) and one CompactFlash™
10. 2 power paths with terminal block and 12–48VDC
11. Din-rail mounting
12. Wall mounting (optional)
13. Meet safety agency requirements (UL508,UL60950) & passed heavy industrial EMI/EMS testing (ex: EN61000-6-4, EN61000-6-2)

➢ Embedded O.S. Supported

The rBOX111-FL not only supports Windows® XP, but also supports embedded OS, such as Windows® XP embedded, Windows® 7 embedded, Windows® CE 6.0 and Linux. For storage device, the rBOX111-FL supports one type II CompactFlash™ slot.

- Intelligent AXView & SNMP V1/V2c

  The rBOX111 features SNMP V1/V2c support for secured network management. To streamline implementation of management applications, Axiomtek has launched exclusive "AXView" monitoring software package for customers to build their own management systems easily and quickly. Axiomtek AXView also contains a variety of easy-to-use management utilities, agent services and libraries. For more product information, please visit our global website on Axiomtek AXView

  http://axiomtek.com/products/ViewProduct.asp?view=1001

1.2 System Specifications

1.2.1 CPU

- Onboard Intel® ATOM™ Z510PT (1.1 GHz) or Z520PT (1.33 GHz) processors with FSB 400/533MHz.

1.2.2 Chipset

- Intel System Controller Hub US15WPT

1.2.3 BIOS

- Phoenix AwardBIOS

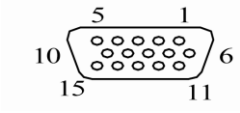
1.2.4 System Memory

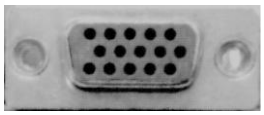
- One 200-pin SO-DIMM support DDR2 400/533MHz max. up to 2GB

1.2.5 Graphics Chip

- Intel GMA500 graphics Core integrate in US15W PT
- DB15 VGA port
- VGA IO Pin Define :

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C.	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK





1.2.6 Video Memory

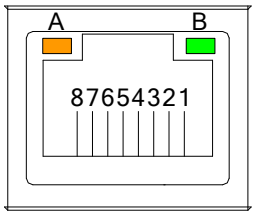
- Share Memory max. up to 254MB

1.2.7 LAN

- LAN 1 / LAN 2
  - GBE Intel 82574, 10/100/1000Mbps LAN w/ Magnetic Isolation Protection 1.5KV
  - LED definition: Active LED (Yellow flashing), 10 LAN LED (NO Light), 100 LAN LED (Green Light), 1000 LAN LED (Orange Light)

GbE(10M/100M/1000M)

Pin	Signal
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	MDI2-
7	MDI3+
8	MDI3-
A	Active LED (Yellow)
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)



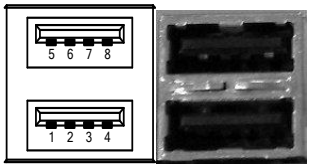
1.2.8 Storage

- 1 x 2.5" SATA SSD (or HDD) drive bay
- 1 x CompactFlash TypeII slot (easy-to- access)

1.2.9 USB

- 2 x USB2.0
- With power distribution control and over current protection
- USB Pin Define :

Pin	Signal USB Port 0	Pin	Signal USB Port 1
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	Ground (GND)	8	Ground (GND)



- USB power (5V) distribution control.

  Some program and sample code for USB power distribution control are offered in Windows and Linux.

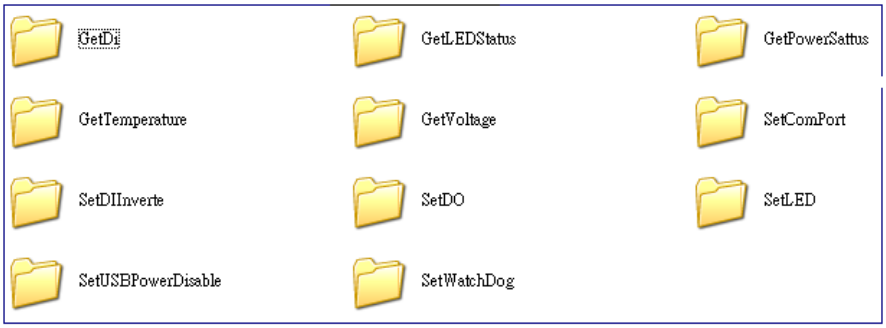
  - Windows: Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our Axiomtek's website directly.

➢ **Axiomtek's website for AXView :**

http://axiomtek.com/products/ViewProduct.asp?view=1001

AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewProduct.asp?view=1018

USB Power Distribution Control Sample code:

- **Windows:**

\AXView Version\Samplecode\c\AXView\SetUSBPowerDisable \AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox111-bsp-user-1.0.0\rbox111\src\librb100.c

int _rb201_usb_power(int number, int onoff)

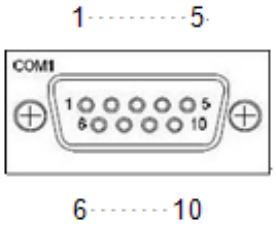
1.2.10 COM

- 4 ports DB9 Pin Define RS-232/422/485
- ESD Protection 15KV
- Magnetic Isolation Protection 2KV
- COM1,COM2 speed up to 115.2kbps
- COM3-COM4 Serial Port Speed up to 921.6kbps
- rBOX support jumper less design. All of the COM port interface RS232/422/485 can be selected by BIOS menu or software program.
- It also supports Auto Flow Control in RS485 mode
- Serial Port Pin Define : (DB9 Male)

rBOX101

COM1/COM2

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	--
4	DTR	RX-	--
5	Ground	Ground	Ground
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--

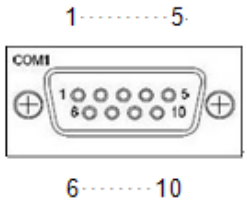


rBOX101

COM3/COM4

Doesn't support RI signal

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	--
4	DTR	RX-	--
5	Ground	Ground	Ground
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--



- Some program and sample code for COM port interface type are offered in Windows and Linux.

  - Windows:Please refer it from our Axiomtek AXView which on Axiomtek's website directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

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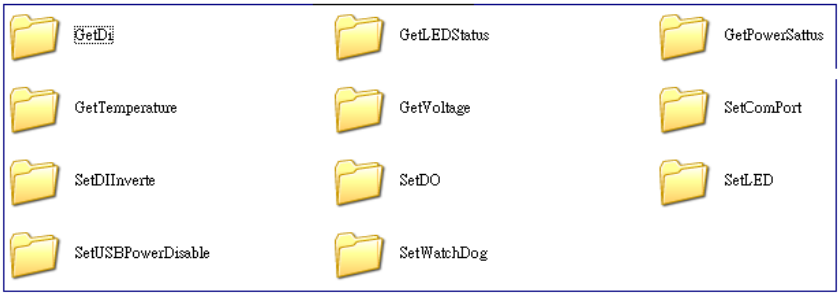
AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewProduct.asp?view=1018

COM port interface selection Sample Code :

-Set COM port interface type(Windows, Linux)

- **Windows:**

-RS232/422/485 interface selection:

\AXView Version\Sample code\c\AXView\SetComPort\ AXVIEW_DLL_Test.cpp

- **Linux:**

-RS232/422/485 interface selection:

\rBox111-bsp-user-1.0.0\rbox111\src\librb100.c

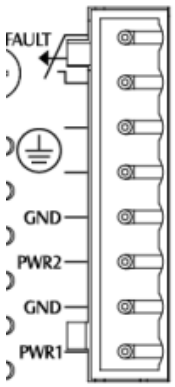
int _rb201_set_comport(int number, int type)

http://axiomtek.com/products/ViewProduct.asp?view=1018

1.2.11 Power

- 2 power paths
- 2 power sources must be same voltage and DC input range 12-48V.
- Main power source is for Input Power Path 1, Backup power source is for Input Power Path 2.
- Only one power source must be for Input Power Path 1.
- DC Input has UVP/OVP/Reverse protection.
- Reset Button without Power Switch
- DC Terminal Block

Pin	DC Signal Name
1	AL-
2	AL+
3	SG
4	SG
5	GND
6	DC2
7	GND
8	DC1



NOTE: If 2 power sources aren't same voltage and the system will be possible damage.

NOTE: When the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarted.

1.2.12 WatchDog Timer (WDT)

- rBox support two Watchdog timers. Those can cause system reset when timer expired.
- WDT 1 : one step is 1sec, 255 levels

  WDT 2 : one step is 250ms, 255 levels
- Some program and sample code for two Watchdog timers are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

➢ **Axiomtek's website for AXView :**

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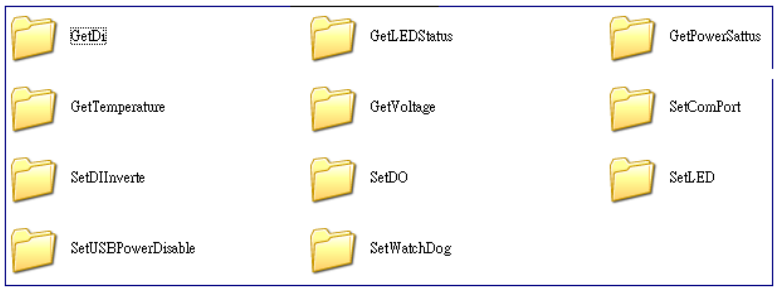
AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

  http://axiomtek.com/products/ViewProduct.asp?view=1018

Watch Dog Timer Sample code:

-Super IO(Linux)

-CPLD(Windows, Linux)

- **Windows:**

-CPLD:

\AXView Version\Sample code\c\AXView\SetWatchDog\ AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox111-bsp-user-1.0.0\rbox111\src\librb100.c

-Super IO:

int _rm820_WDT_enable(unsigned char scale, unsigned char timeout)

int _rm820_WDT_disable(void)

int _rm820_WDT_reload(void)

int _rm820_read_WDT_config(unsigned int *time)

-CPLD:

unsigned char _rb201_get_WDT_value(void)

int _rb201_WDT_enable(unsigned char timeout)

int _rb201_WDT_disable(void)

1.2.13 System LED

For maintenance issue, IO board will have below LED.

1. DC PWR1 : Green
2. DC PWR2 : Green
3. Alarm : Red
4. OS Ready : Yellow
5. COM TX1 : Green
6. COM RX1 : Green
7. COM TX2 : Green
8. COM RX2 : Green
9. COM TX3 : Green
10. COM RX3 : Green
11. COM TX4 : Green
12. COM RX4 : Green

LED Name	Description	Color	Note
DC PWR1	Indicate the DC1 input status. When the DC input is acceptable, the LED will ON.	Green	
DC PWR2	Indicate the DC2 input status. When the DC input is acceptable, the LED will ON.	Green	
Alarm	The LED will ON if having below condition. 1. DC PWR1 or PWR2 is lost. (default) 2. User define event. The behavior of Alarm and Relay are the same. When the LED of Alarm is ON and the Relay will be turn on at the same time.	Red	

LED Name	Description	Color	Note
RDY/ACT	The LED for RDY/ACT can help users to judge BIOS finish or not and the OS can normal work or not. When the BIOS finish the configuration of system, the LED will ON. After this the LED will flash when the storage is accessed. - The LED will flash when the storage is accessed. - The LED always ON without any flash for a long time, the OS is possible crashed. - The LED isn't ON for a long time, it means the system is on shutdown status.	Yellow	
COM TX1	When COM1 transmit data the LED will on.	Green	
COM RX1	When COM1 receive data the LED will on.	Green	
COM TX2	When COM2 transmit data the LED will on.	Green	
COM RX2	When COM2 receive data the LED will on.	Green	
COM TX3	When COM3 transmit data the LED will on.	Green	
COM RX3	When COM3 receive data the LED will on.	Green	
COM TX4	When COM4 transmit data the LED will on.	Green	
COM RX4	When COM4 receive data the LED will on.	Green	

NOTE **When *the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarded.***

- Some program and sample code for Alarm LED and Relay Output are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

- Alarm LED and Relay output Sample Code:

  - Set Alarm LED and Relay status(Windows, Linux)

  - Get Alarm LED and Relay status(Windows, Linux)

  - Get Power status(Windows, Linux)

- **Windows:**

-Get the LED status:

\AXView Version\Samplecode\c\AXView\GetLEDStatus \AXVIEW_DLL_Test.cpp

-Set the LED status:

\AXView Version\Samplecode\c\AXView\SetLED \AXVIEW_DLL_Test.cpp

-Get Power Status:

\AXView Version\Sample code\c\AXView\GetPowerSattus \AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox111-bsp-user-1.0.0\rbox111\src\librb100.c

-Get the LED status:

int _rb201_get_power_usr_alarm_status(void)

-Set the LED status:

int _rb201_power_alarm_ctl(int onoff)

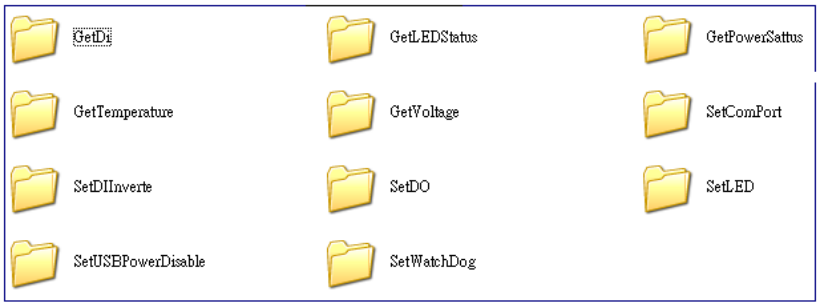
-Get Power Status:

int _rb201_read_power_status(int number)

- **Axiomtek's website for AXView :**

http://axiomtek.com/products/ViewProduct.asp?view=1001

AXView Version → Sample Code → C (or C#) → AXView



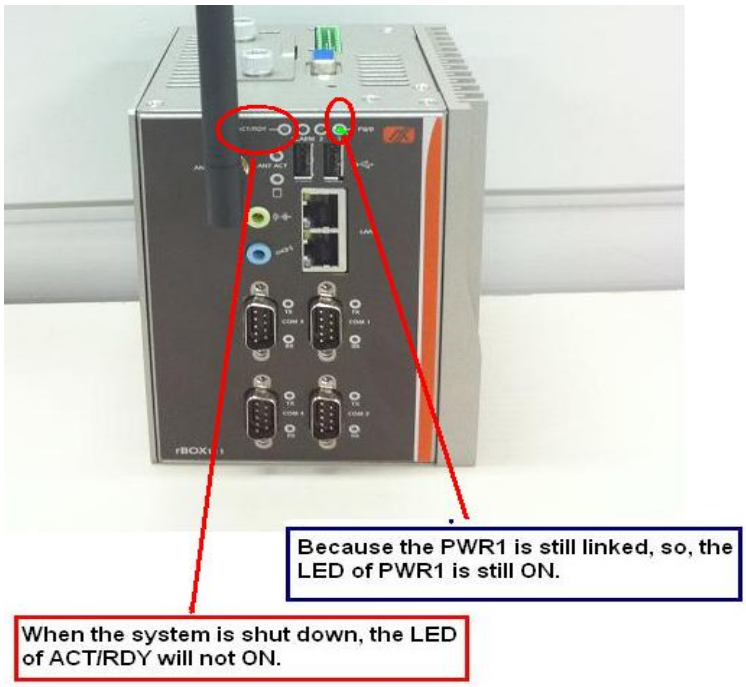
- **Axiomtek's website for Linux :**

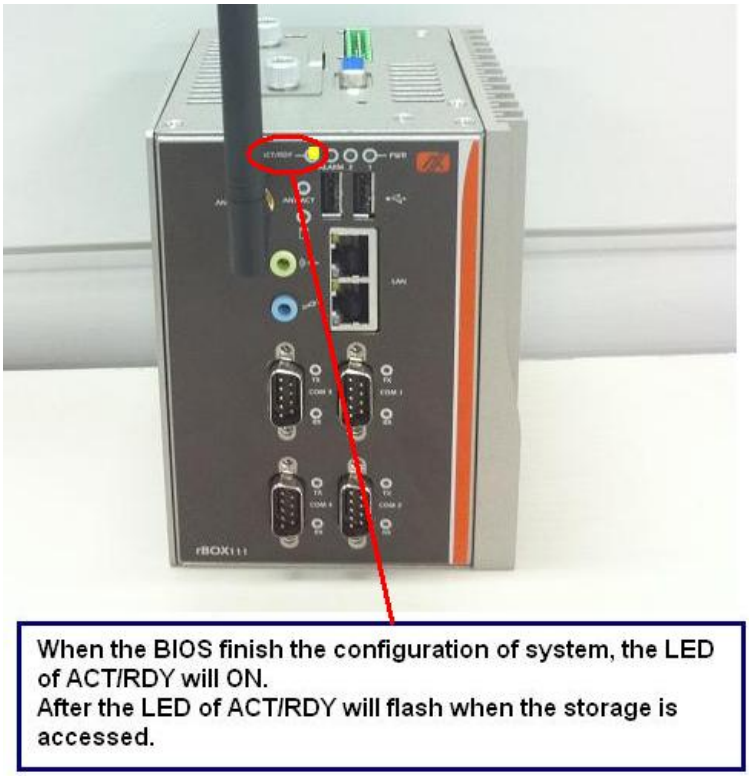
http://axiomtek.com/products/ViewProduct.asp?view=1018

Below pictures are the LED example:

Indicate the PWR1 input status.
When the DC input is acceptable, the LED will ON.

The LED will ON if having below condition.
1. DC PWR1 or PWR2 is lost. (default)
2. User define event.
The behavior of Alarm and Relay are the same.
When the LED of Alarm is ON and the Relay will be turn on at the same time.


Because the PWR1 is still linked, so, the LED of PWR1 is still ON.
When the system is shut down, the LED of ACT/RDY will not ON.


When the BIOS finish the configuration of system, the LED of ACT/RDY will ON.
After the LED of ACT/RDY will flash when the storage is accessed.

1.2.14 Alarm Contact

- The rBox can support two DC power source. When lost one of them will cause Alarm LED on and trigger Relay out for remote notice.
- We also provide the register for user to define their event for trigger the Alarm LED and Relay. Alarm LED and Relay output have the same activity depend on DC status and register control.
- 1 relay output
- Relay output with 0.5A @ 30VDC
- Event : Power Fail and User define
- Some program and sample code for Alarm LED and Relay Output are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

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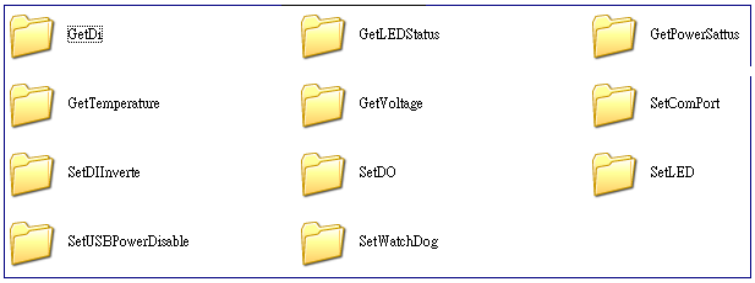


➢ **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewProduct.asp?view=1018

Alarm LED and Relay output Sample Code:

- Set Alarm LED and Relay status(Windows, Linux)
- Get Alarm LED and Relay status(Windows, Linux)
- Get Power status(Windows, Linux)

- **Windows:**

-Get the LED status:

\AXView Version\Samplecode\c\AXView\GetLEDStatus \AXVIEW_DLL_Test.cpp

-Set the LED status:

\AXView Version\Samplecode\c\AXView\SetLED \AXVIEW_DLL_Test.cpp

-Get Power Status:

\AXView Version\Sample code\c\AXView\GetPowerSattus \AXVIEW_DLL_Test.cpp

- Linux :

-Get the LED status:

int _rb201_get_power_usr_alarm_status(void)

-Set the LED status:

int _rb201_power_alarm_ctl(int onoff)

-Get Power Status:

int _rb201_read_power_status(int number)

- **rBOX Alarm Application:**

Troubleshooting is very important in many applications.

In the rBox series we can provide three kinds of way for troubleshooting.

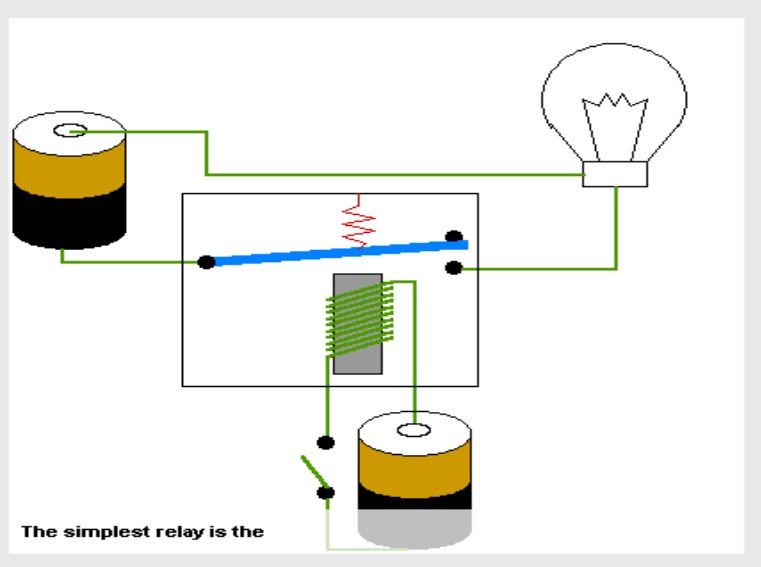
- Alarm LED
- Relay out
- SNMP through AXView

1. Maintenance Staff can check the Alarm LED for basic troubleshooting

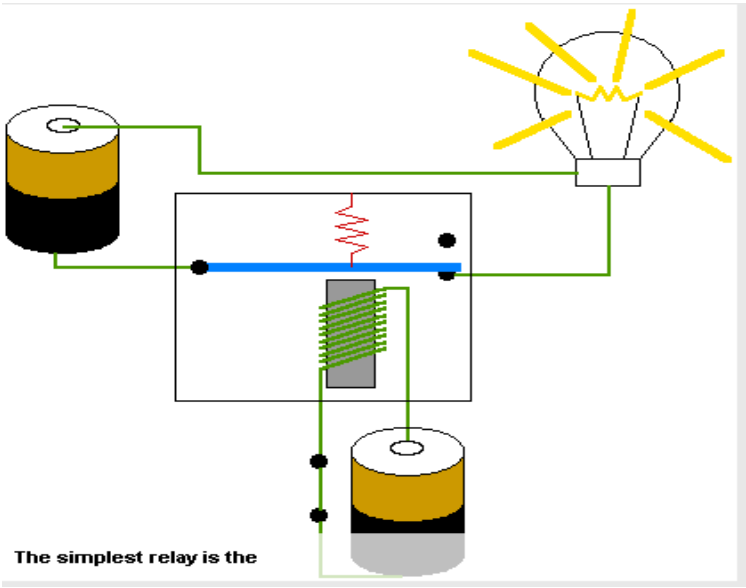
2. Relay output

   Below is a very simple application for remote notice use relay and lamp.

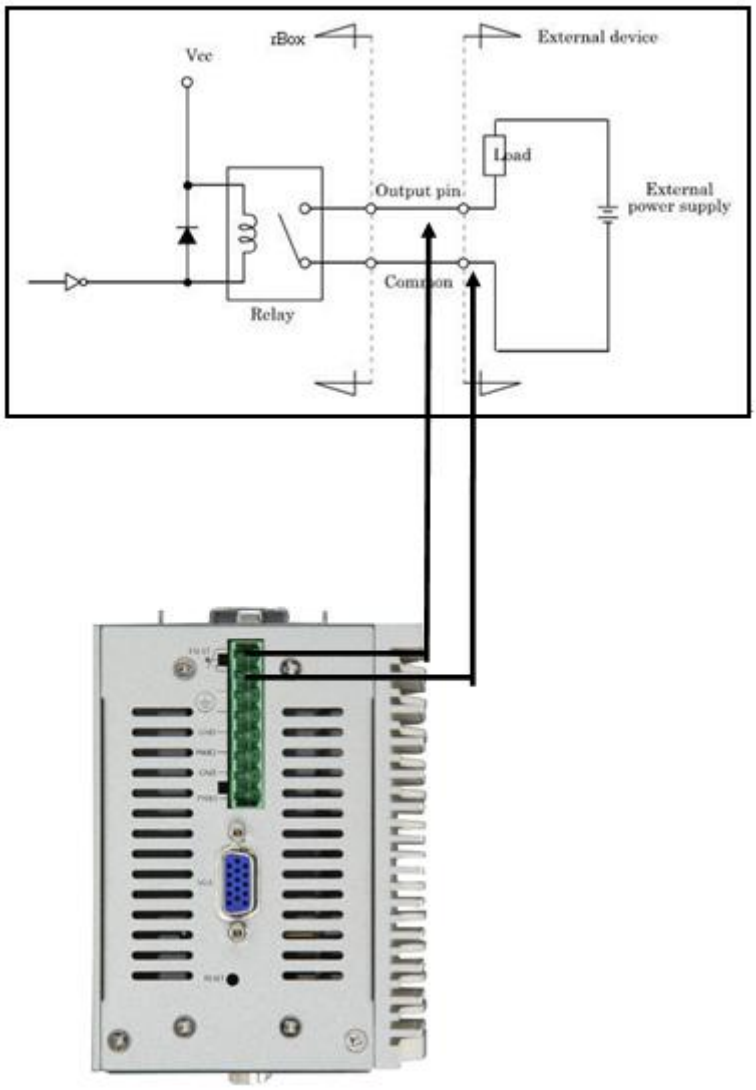
   a) Normal



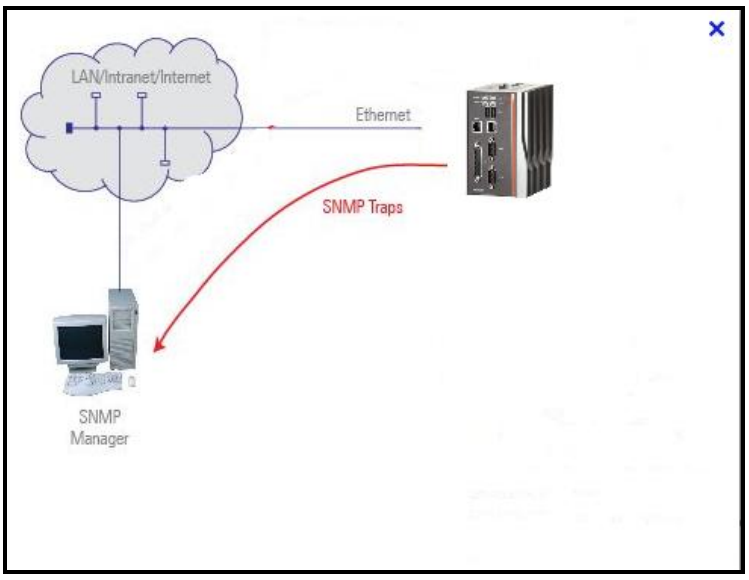
   b) Warning



c) Relay wiring of rBox



3. SNMP



1.2.15 Wireless (3G/GPRS or Wifi)

- 1 x Mini Card (Supports USB interface on 3G/GPRS or supports PCIe interface on Wifi)
- 1 x SIM Card Socket (easy-to-access).

1.2.16 Reset Bottom

- 1 x Reset bottom

NOTE: When the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarted.

1.2.17 Operation Temperature

- -40℃ ~ +70℃ (-40 ºF ~ +158ºF), with W.T. (Memory & CF)

1.2.18 Storage Temperature

- -45℃ ~ +85℃ (-49 ºF ~ +185ºF)

1.2.19 Humidity

- 5% ~ 95% (non-condensation)

1.2.20 Weight

- 1.38 kg (3 lb) for rBOX111

1.2.21 Dimensions

- 100.6mm(3.18") (W) x110mm(4.33") (D) x135mm(5.31") (H)

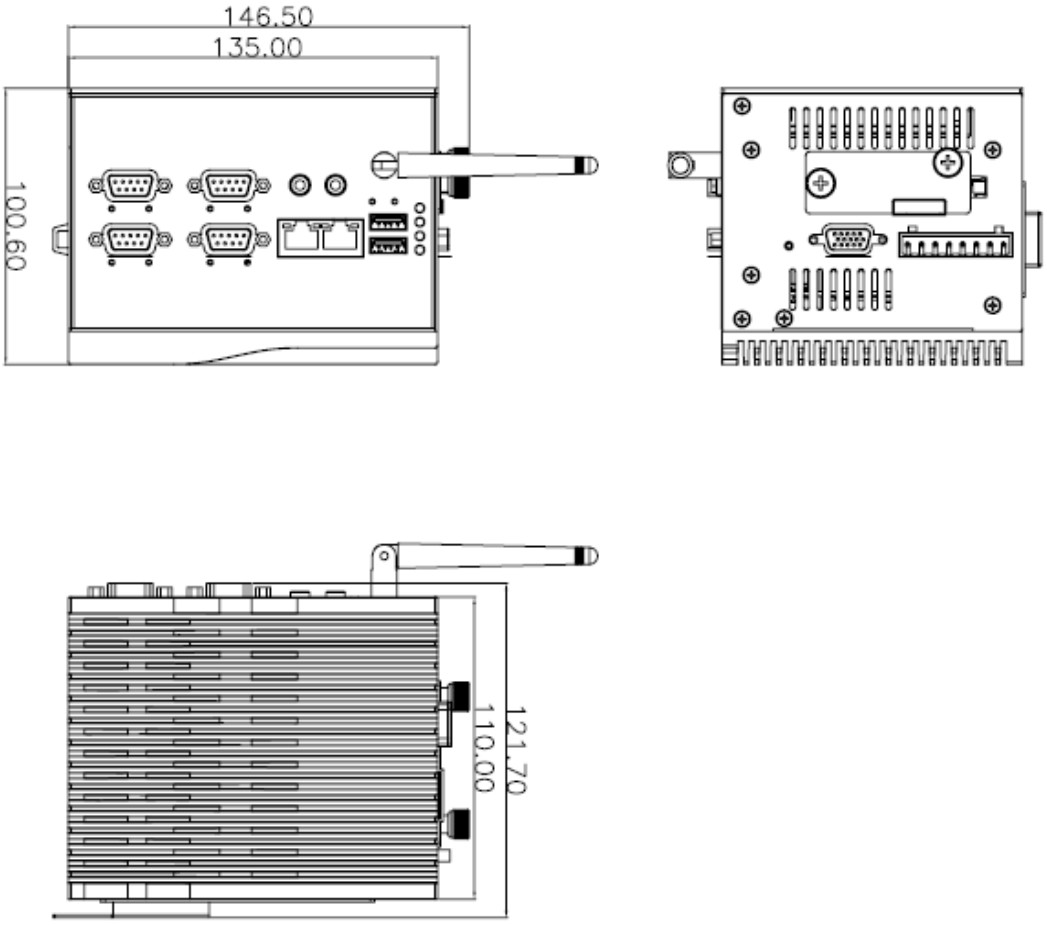
1.2.22 System I/O Outlet

- 4 9-pin D-Sub male connectors, COM1~COM4
- One 15-pin D-Sub female connector for VGA
- Two 10/100/1000Mbps Ethernet with Magnetic Isolation Protection
- Two USB 2.0 connectors
- Two DC Powers Input with terminal block
- Alarm Contact
- Wireless (3G/GPRS or WiFI)

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

1.3 Dimensions

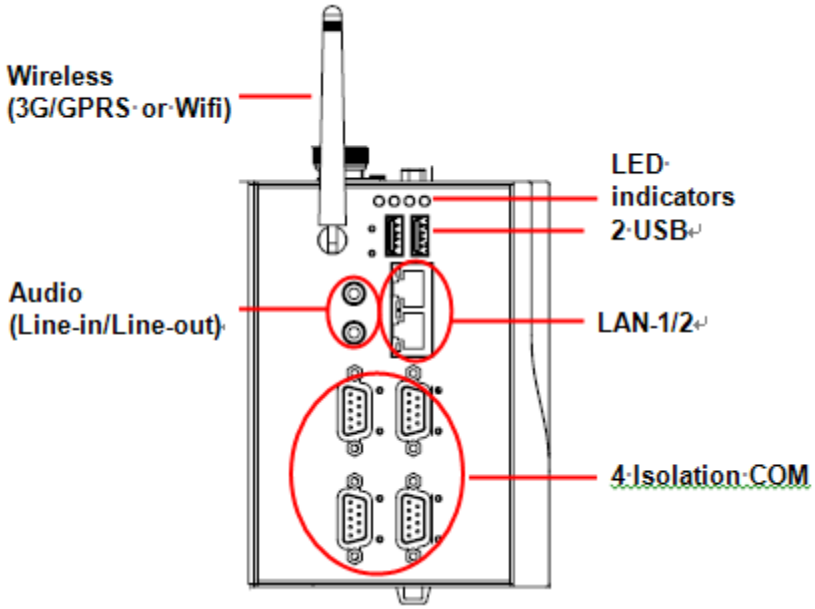
The following diagrams show you dimensions and outlines of the rBOX111-FL



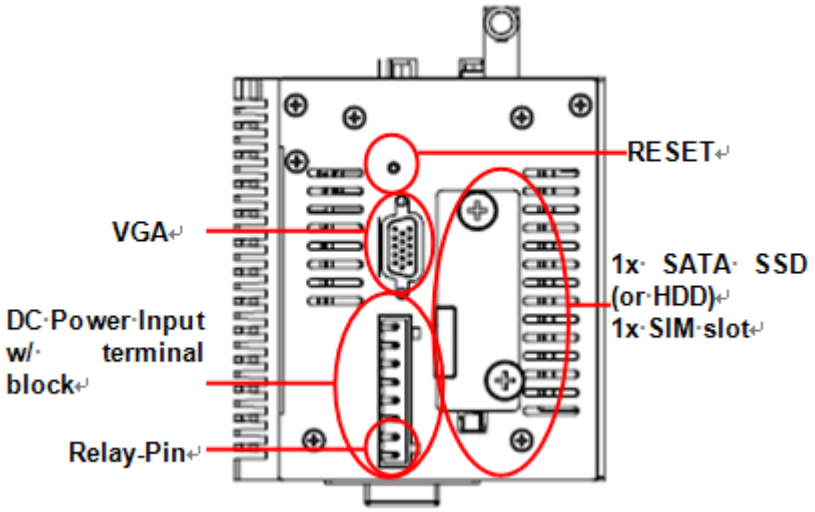
1.4 I/O Outlets

The following figures show you I/O outlets on front view and top view of the rBOX111-FL.

- **Front View**



- **Top View**



1.5 Packing List

The package bundled with your rBOX111-FL should contain the following items:

- rBOX111-FL System Unit x 1
- CD x 1 (For Driver and User's Manual)
- Power terminal block x1
- Din-rail kit x1
- Screws
- Quick Manual x1

MEMO:

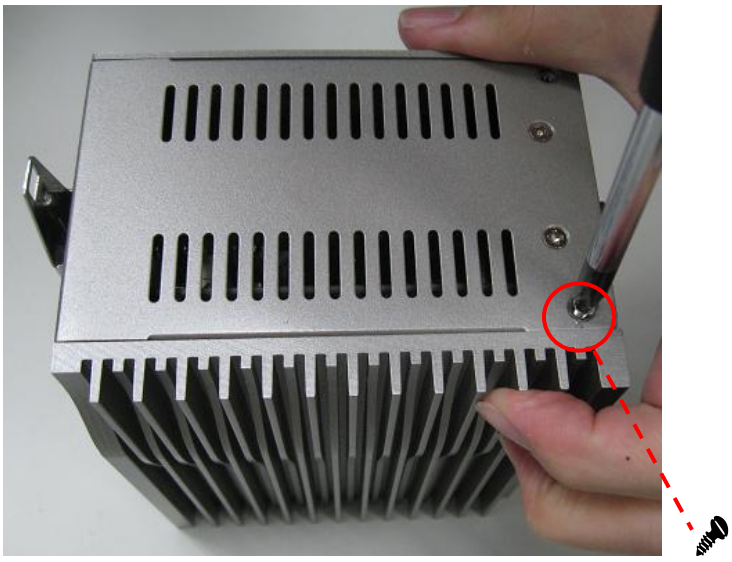
CHAPTER 2
HARDWARE INSTALLATION

The rBOX111-FL is convenient for your various hardware configurations, such as Memory Module and CompactFlash™ card. The chapter 2 will show you how to install the hardware. It includes:

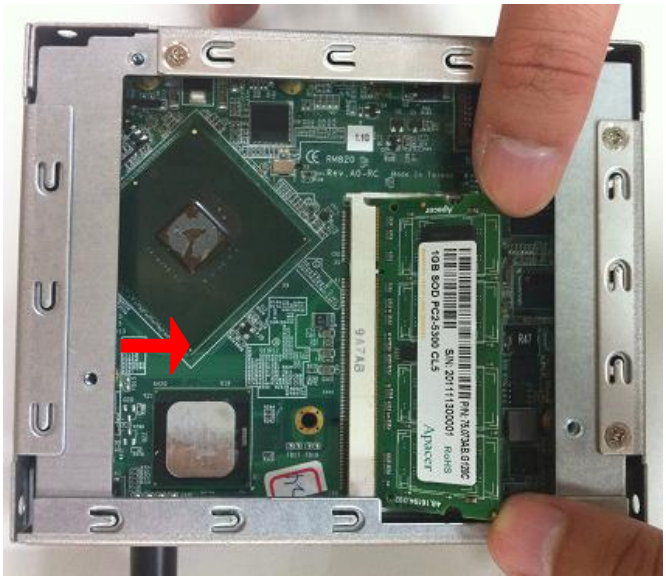
2.1 Installing the Memory Module

Step 1 Turn off the system.

Step 2 Loosen these screws, and remove the top cover from the system.

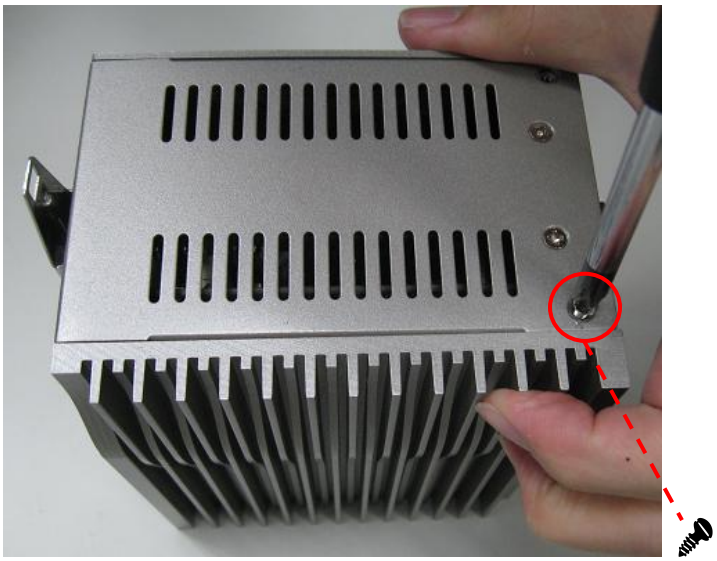


Step 3 Hold one side of the module, and insert the gold colored contact into the socket. Push the module down.



Step 4 The memory module is locked by two latches on the sides.

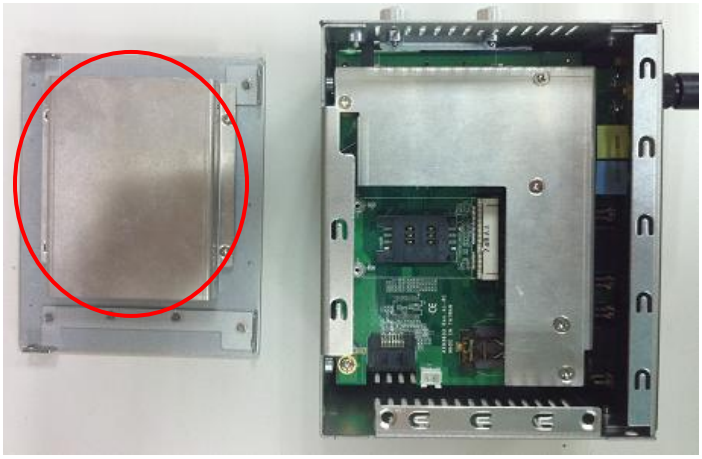
Step 5 Put the cover back to the system, and fasten screws tight close the chassis.



2.2 Installing the Hard Disk Drive

Step 1 Turn off the system.
Step 2 Loosen these screws, and remove the cover from the system.

Step 3 Locate the Hard Disk Drive socket.

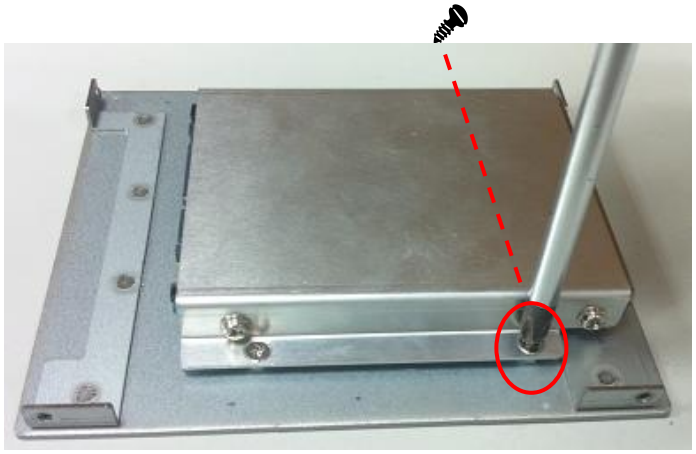


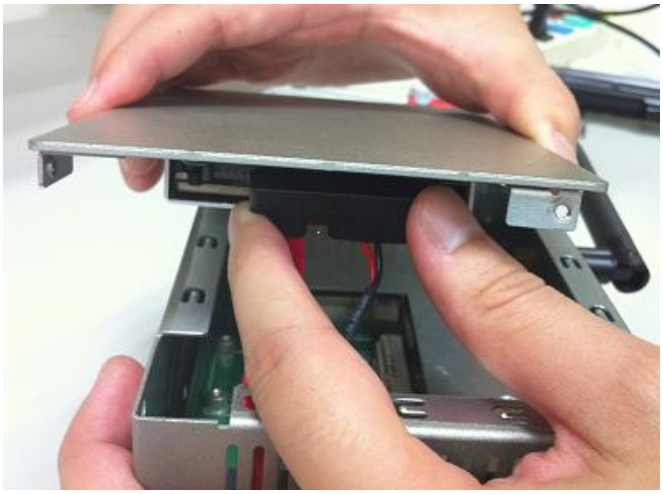
Step 4 Loosen these screws and remove the Hard Disk Drive bracket.

Step 5 Insert the HDD into the socket until it is firmly seated.

Step 6 Put the CompactFlash™ fixing bracket back to the system, and fasten screws tight close the CompactFlash™ fixing bracket.

Step 7 Put the cover back to the system, and fasten screws tight close the chassis.





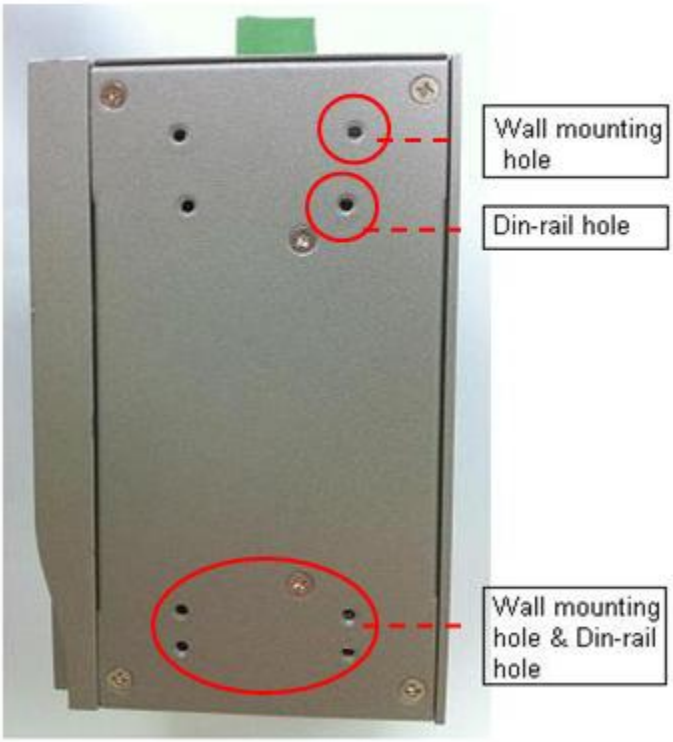
2.3 Installing Din-rail Mounting

The rBOX provides Din-rail Mount that customers can install as below:

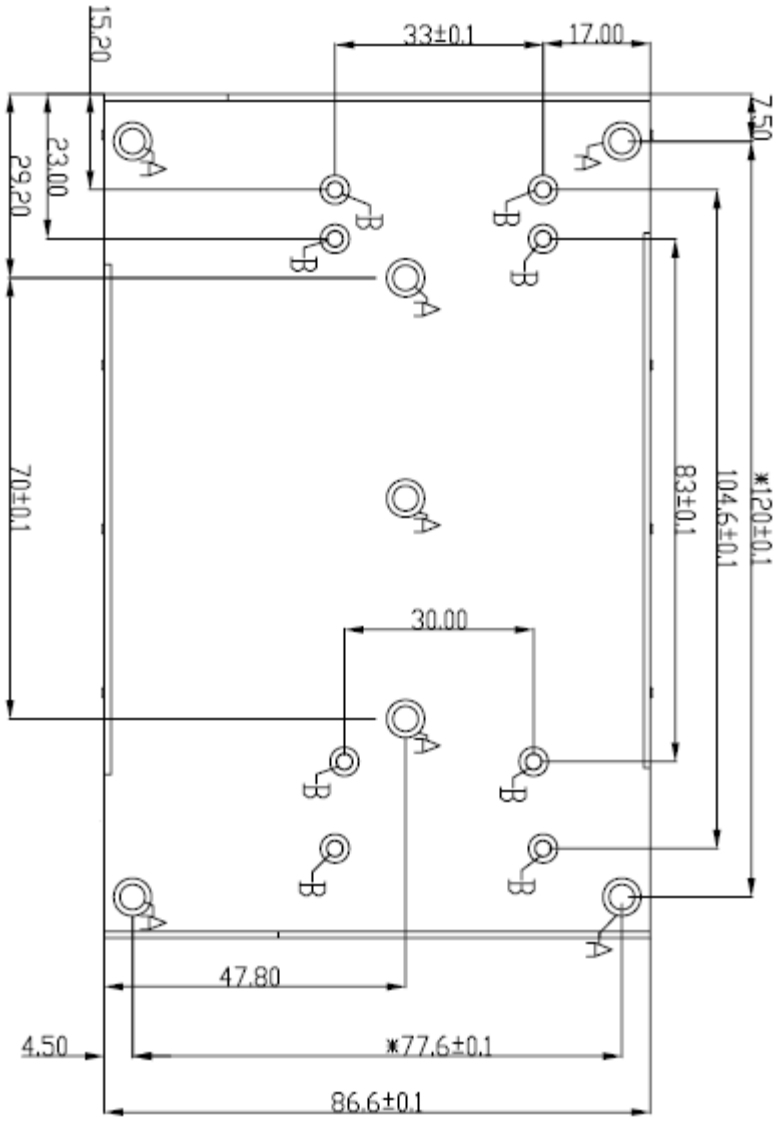
Step 1 Prepare DIN Mount assembling components (screws and bracket) ready.

Step 2 Assembly the bracket to the system, and fasten screws tight.

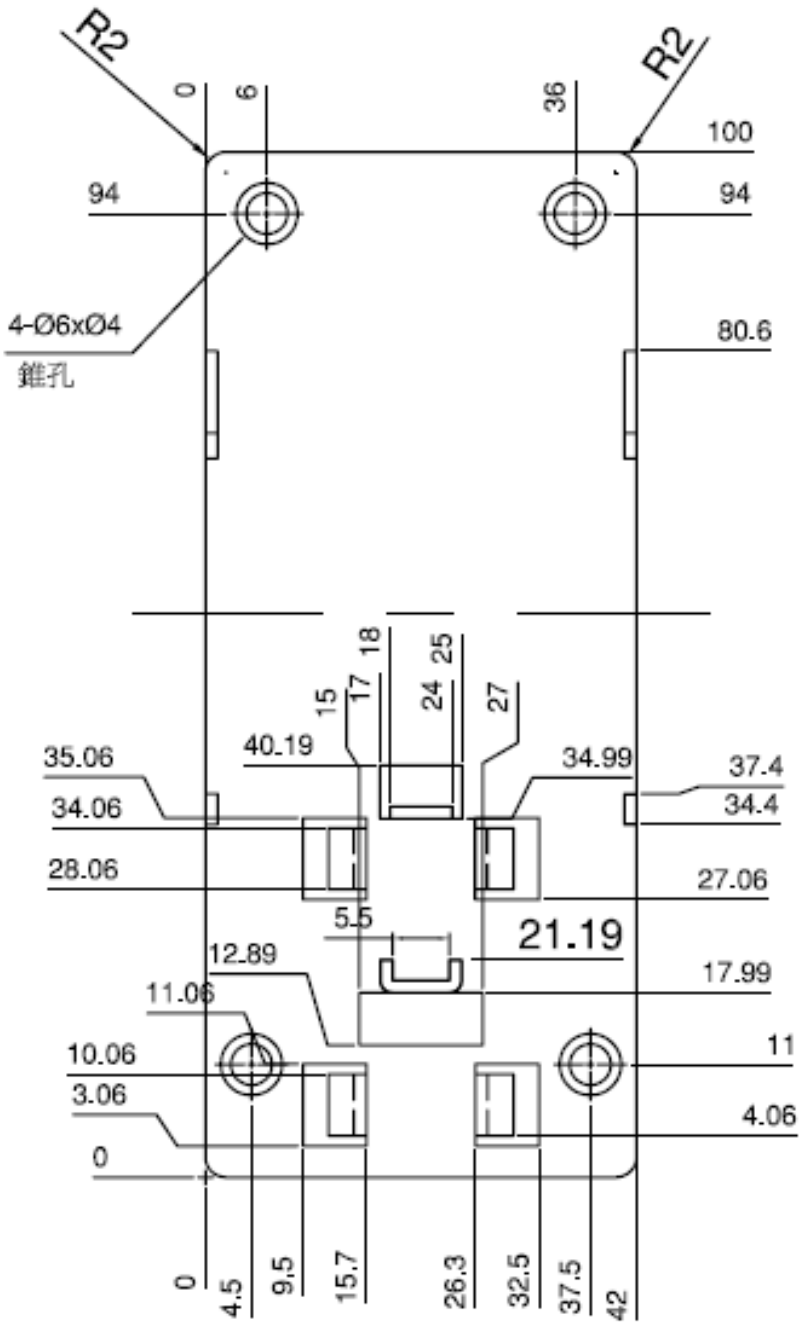
NOTE ***Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.***

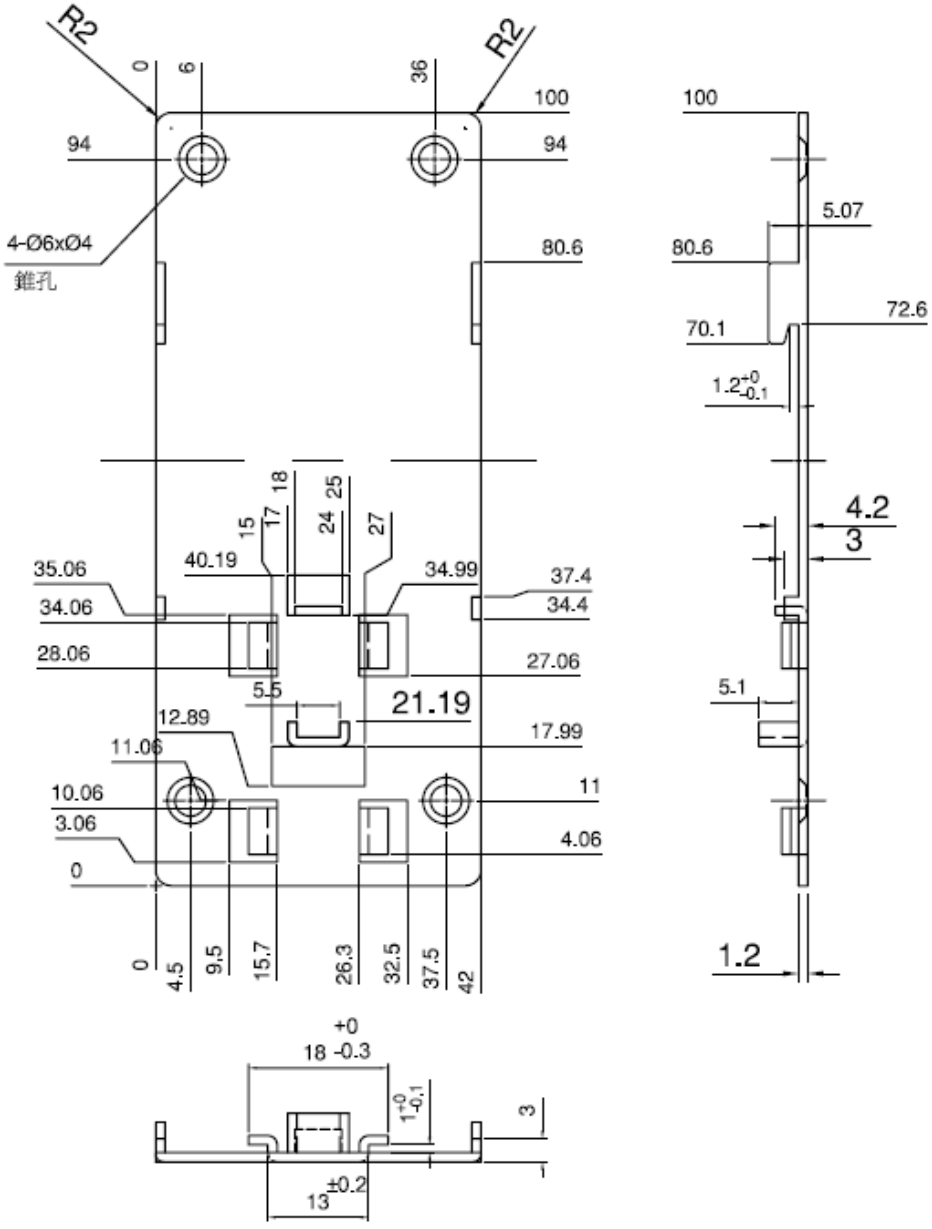


NOTE ***The Din-rail hole drawing for rBOX111 is listed below:***



NOTE ***The Din-rail kit drawing is listed below:***


R2
R2
0
6
36
100
94
94
4-Ø6xØ4
鏜孔
80.6
18
25
15
17
24
27
40.19
35.06
34.99
37.4
34.06
34.4
28.06
27.06
5.5
21.19
12.89
17.99
11.06
10.06
11
3.06
4.06
0
0
4.5
9.5
15.7
26.3
32.5
37.5
42


R2
R2
0
6
36
100
94
94
4-Ø6xØ4
錐孔
80.6
15
17
18
24
25
27
40.19
35.06
34.06
28.06
34.99
37.4
34.4
27.06
5.5
21.19
12.89
17.99
11.06
10.06
3.06
0
11
4.06
0
4.5
9.5
15.7
26.3
32.5
37.5
42
100
5.07
80.6
72.6
70.1
1.2
4.2
3
5.1
1.2
18
3
13
±0.2

- **Setting up rBOX by Din-rail mounting**

The rBOX set up by Din-rail mounting as below:

Step 1 Fixing the rail firstly.

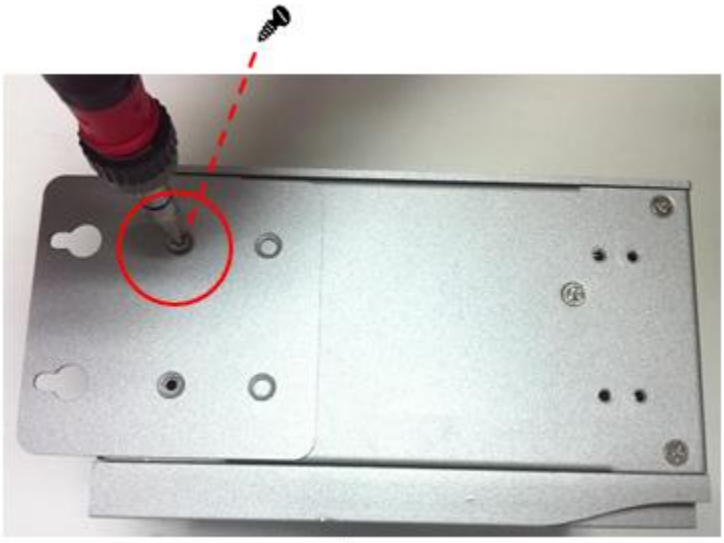
Step 2 Set up the rBOX on the rail by Din-rail mounting

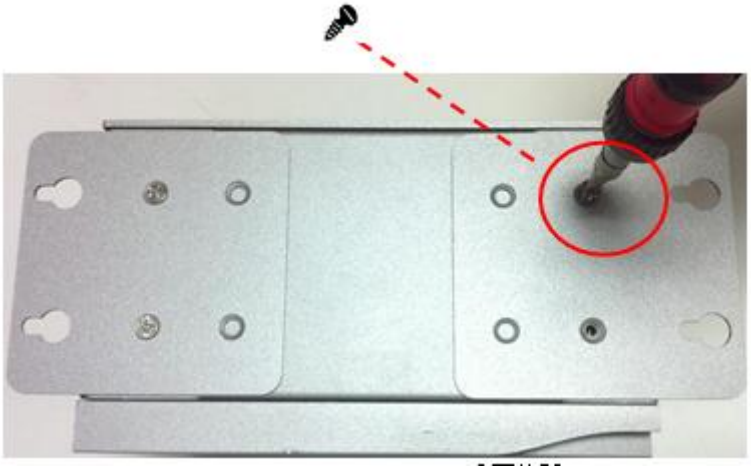
2.4 Installing Wall Mounting (optional)

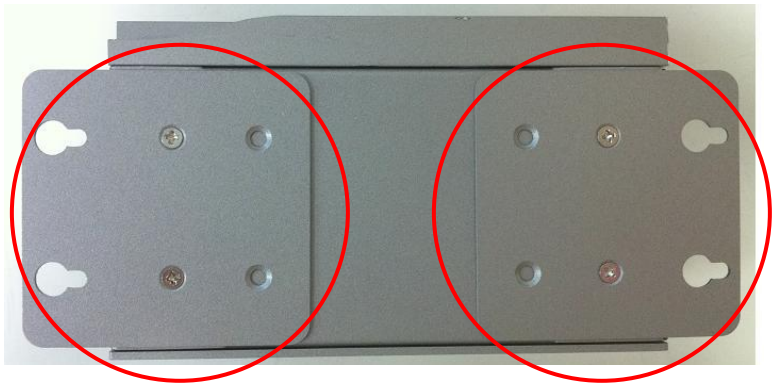
The rBOX provides Wall Mounting that customers can install as below:

Step 1 Prepare Wall Mount assembling components (screws and bracket) ready.

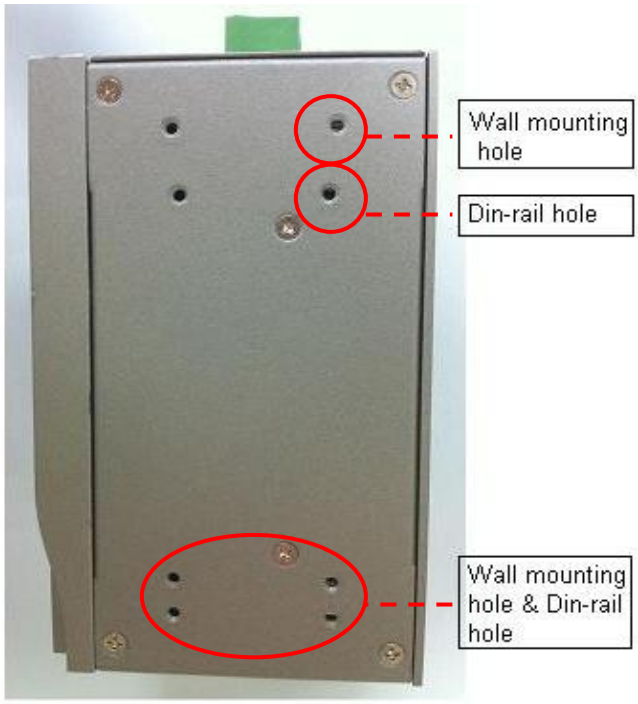
Step 2 Assembly the bracket to the system, and fasten screws tight.







NOTE ***Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.***


Wall mounting hole
Din-rail hole
Wall mounting hole & Din-rail hole

CHAPTER 3
PHOENIX-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 flash-backed-up to save the Setup information whenever the power is turned off.

3.1 Entering Setup

There is one way to enter the Setup program. You may either turn ON the computer and press <Del> immediately.

3.2 Control Keys

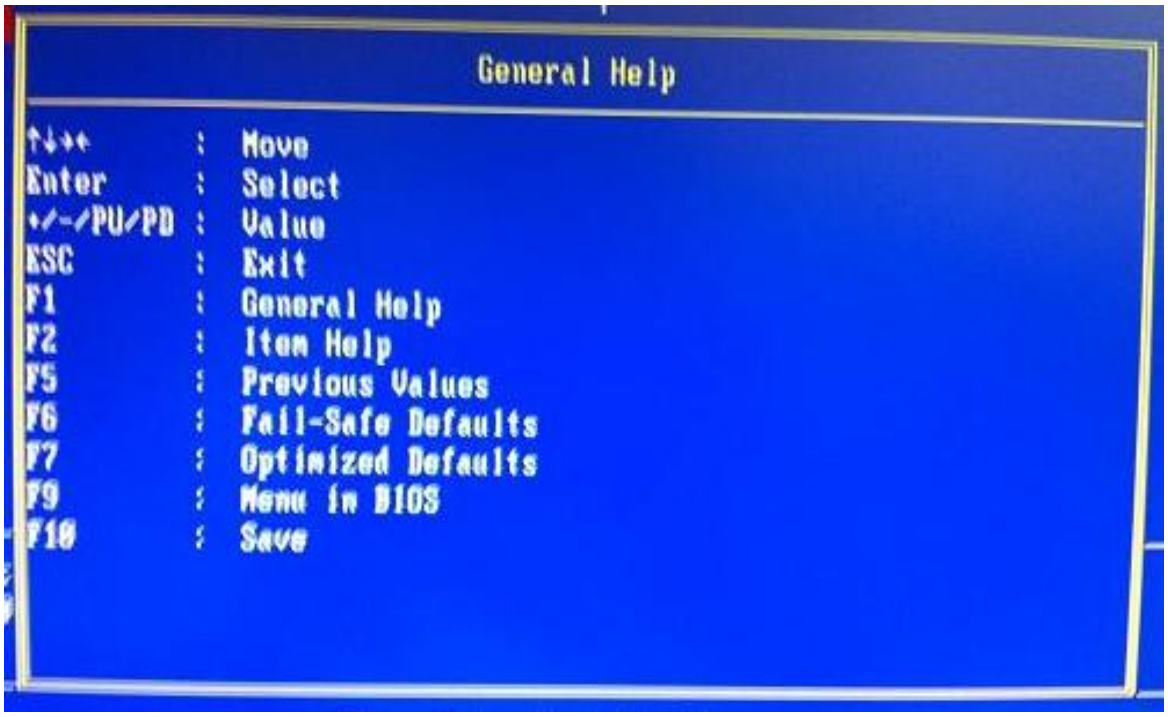
Up arrow	Move to the previous item
Down arrow	Move to the next item
Left arrow	Move to the left side
Right arrow	Move to the right side
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+"key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
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
F10 key	Save all the CMOS changes, only for Main Menu

3.3 Getting Help

Main Menu The online description of the highlighted setup function is displayed at the bottom of the screen.

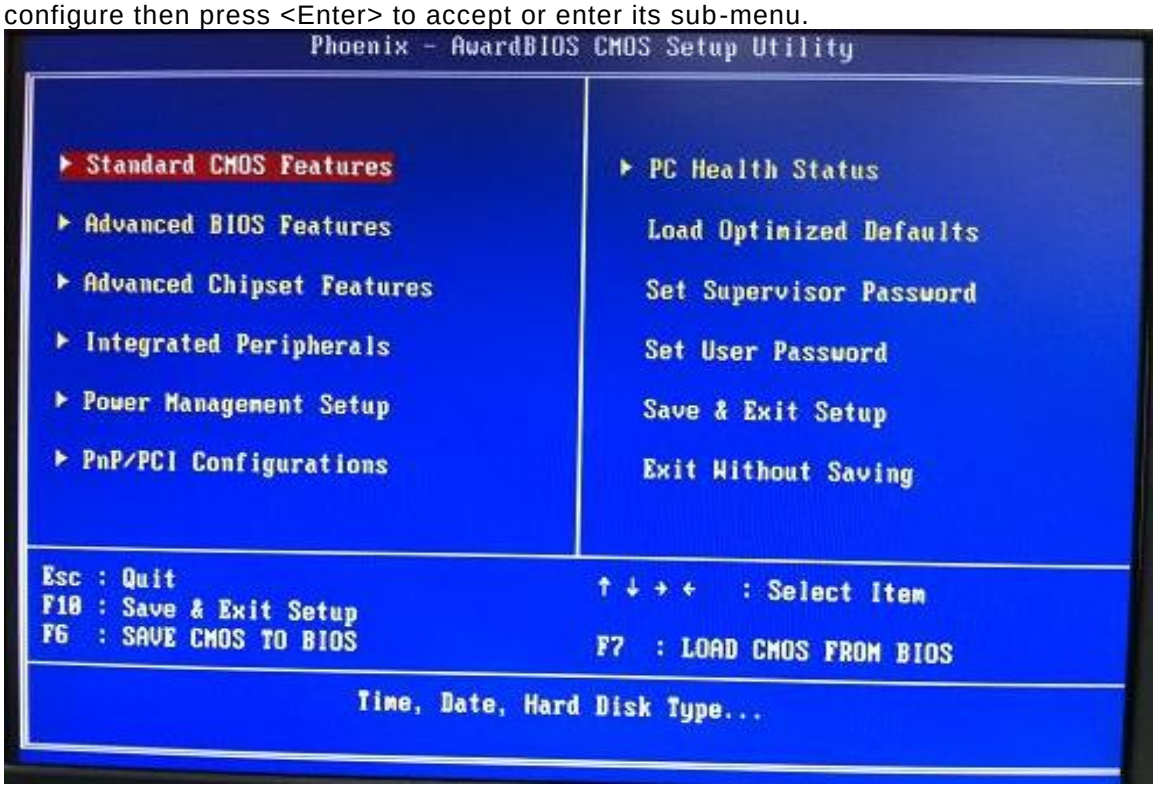
Status Page Setup Menu/Option Page Setup Menu Press <F1> to pop out a General Help Window that provides the description of using appropriate keys and possible selections for highlighted items.

Press <Esc> to exit the Help Window.



3.4 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.

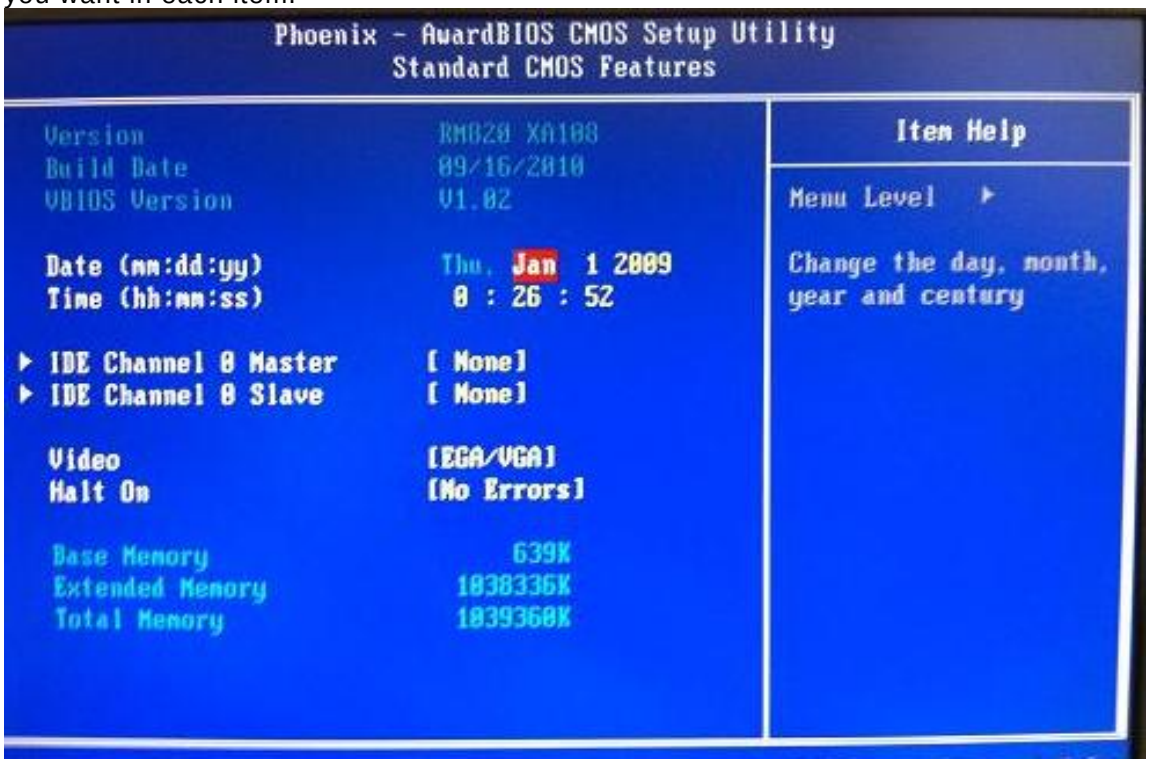


***NOTE** If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

***NOTE** 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.*

3.5 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> <month> <date> <year>.
- **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.

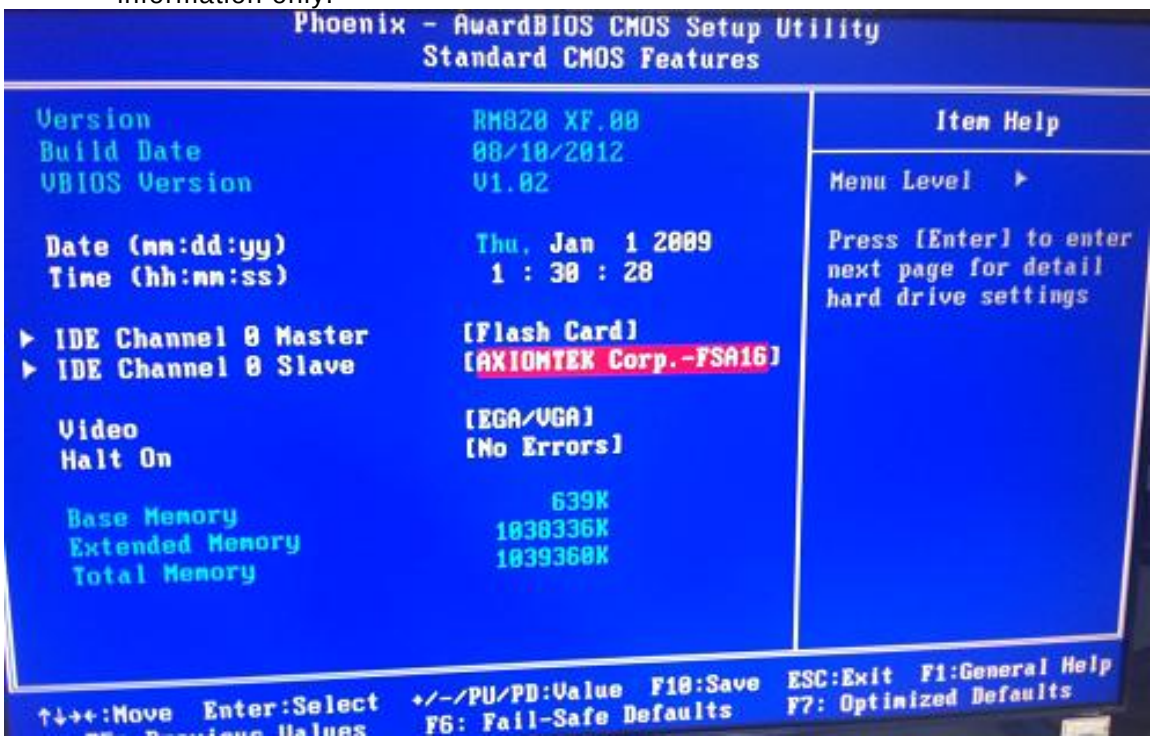
NOTE If system is power failure, the date and time will come back to previous setup.

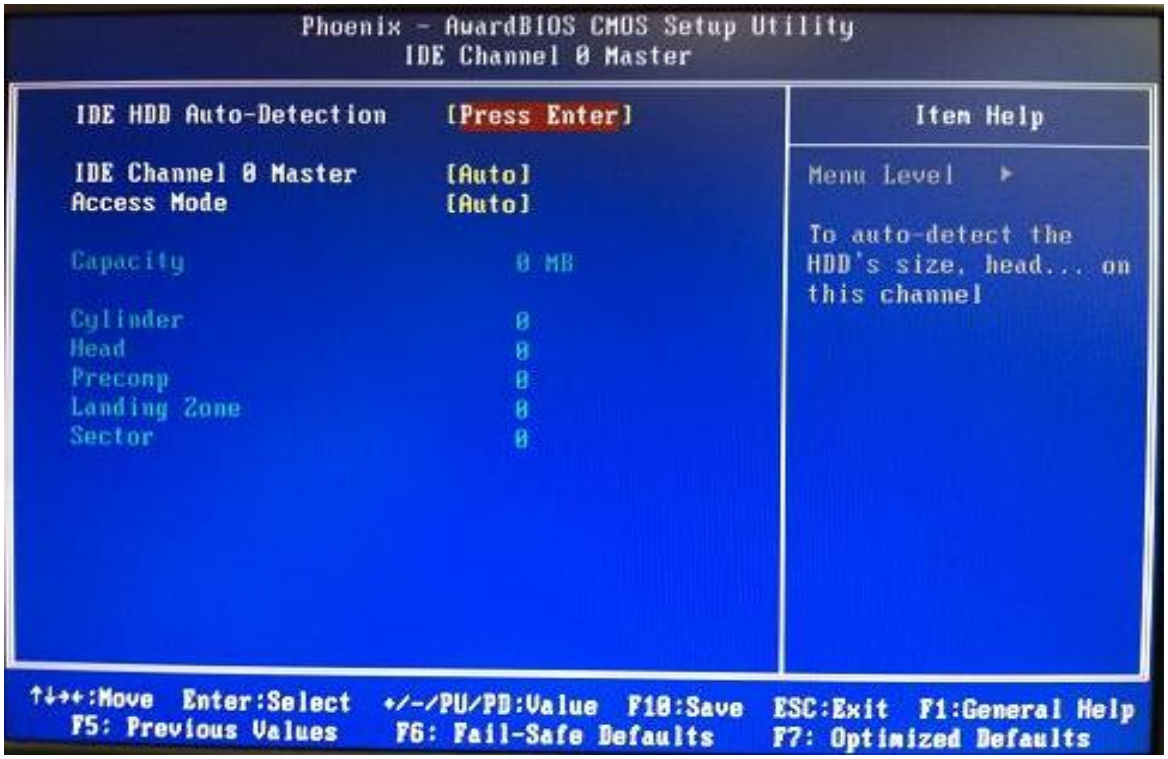
- **IDE Primary Master/Primary Slave**

These items identify the types of each IDE channel installed in the computer, so, IDE type is auto detection.

- **IDE Channel 0 Master/Slave**

  The master iteam shows CF card information only. The slave iteam shows HDD information only.





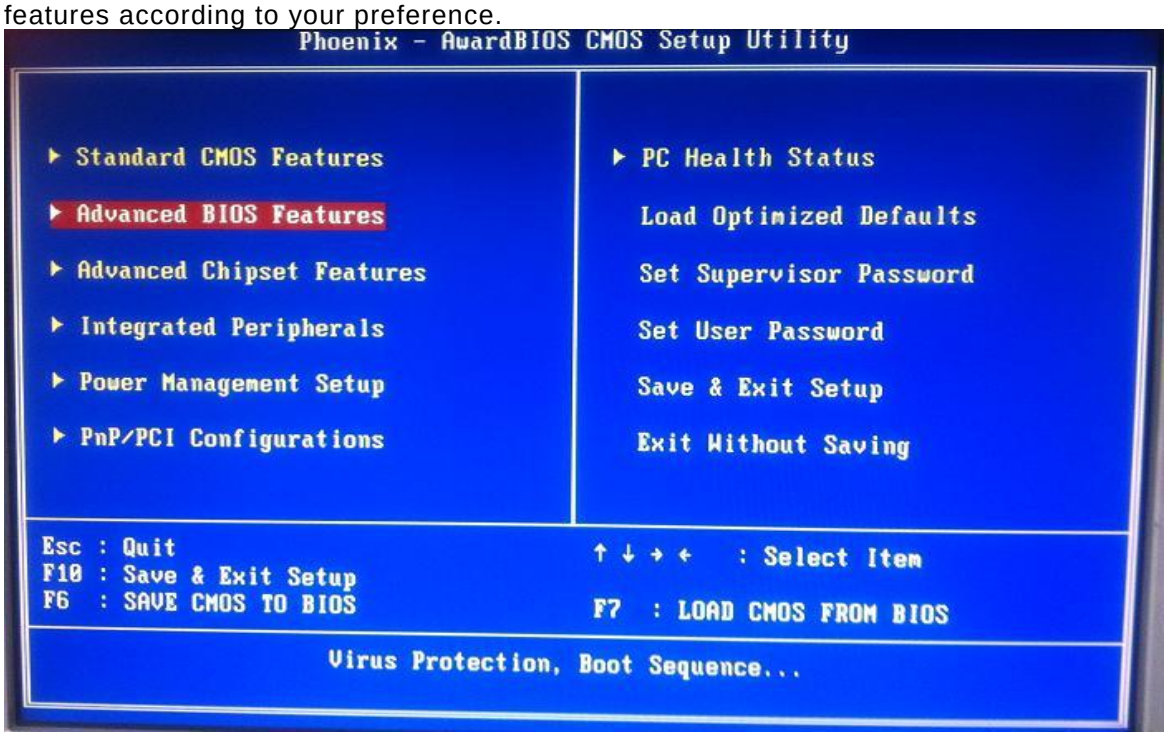
- **Video**
  Select the display adapter type for your system.
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

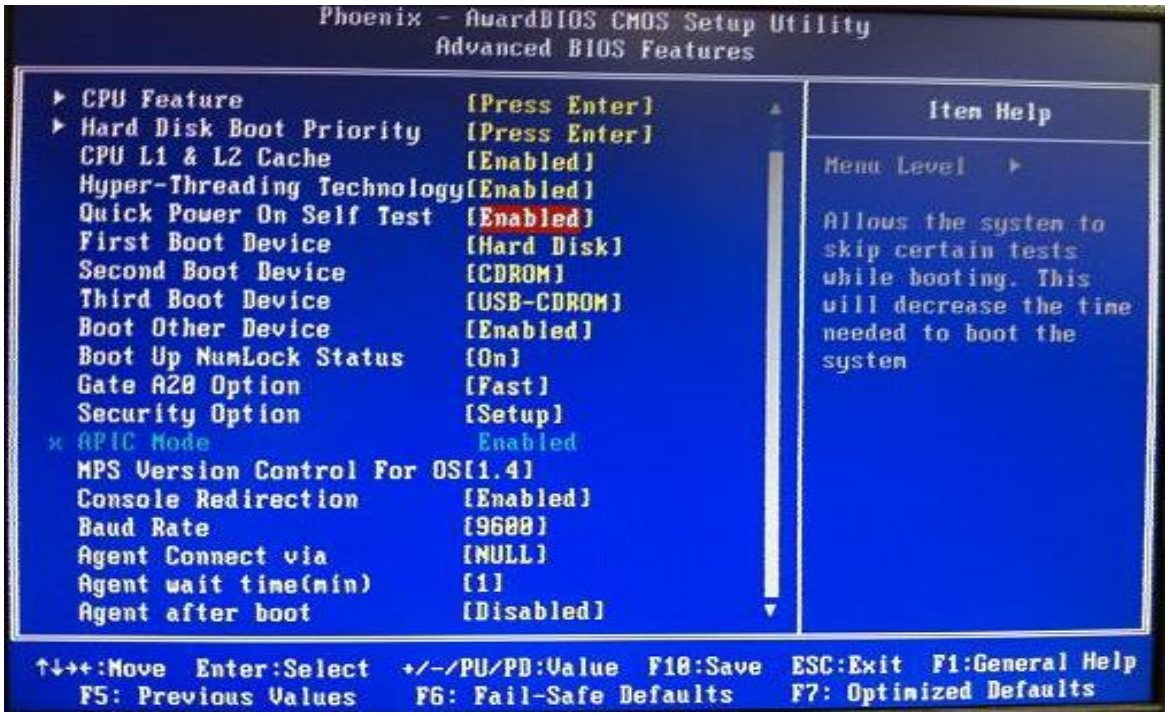
No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.

- Press <Esc> to return to the Main Menu page. USB Device Setting

3.6 Advanced BIOS Features

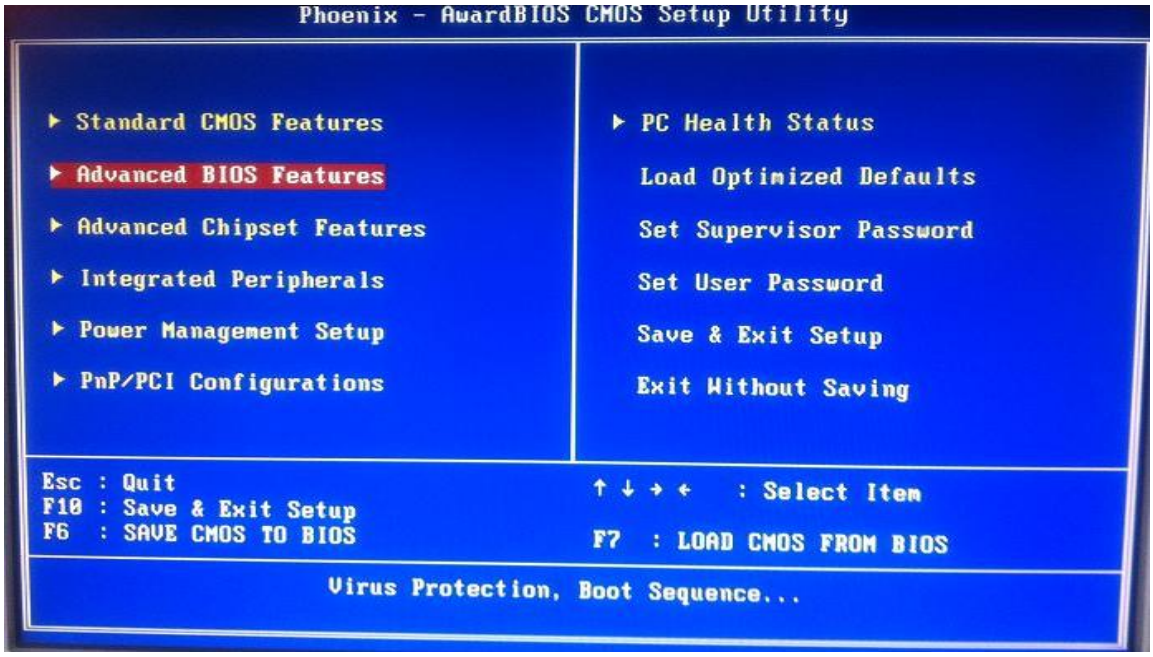
This section allows you to configure and improve your system, to set up some system features according to your preference.



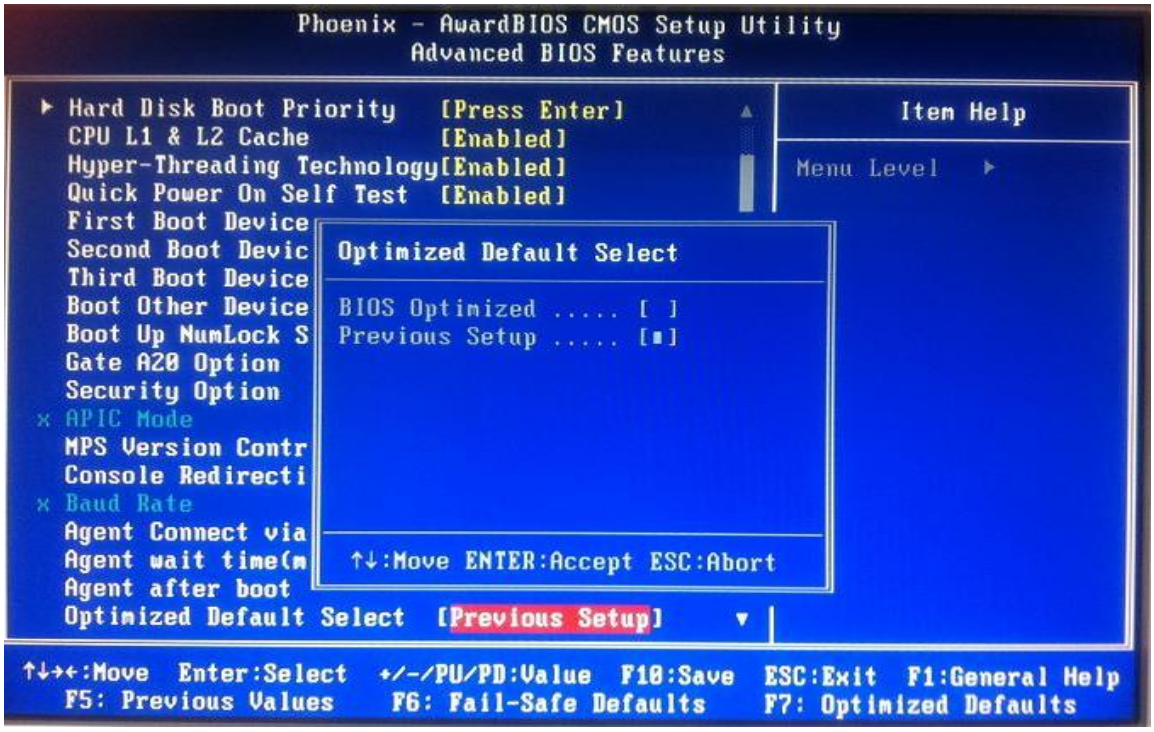


NOTE The BIOS default setting of the system is "Previous Setup". It means that if the system is power failure or power loss, the system will come back to previous setup while be re-boot.

If you want to change the BIOS setting, please set up from "Advanced BIOS Features" (Please refer below graphic.)



Then, to select "BIOS Optimized" or "Previous Setup" under "Optimized Default Select". (Please refer below graphic.)

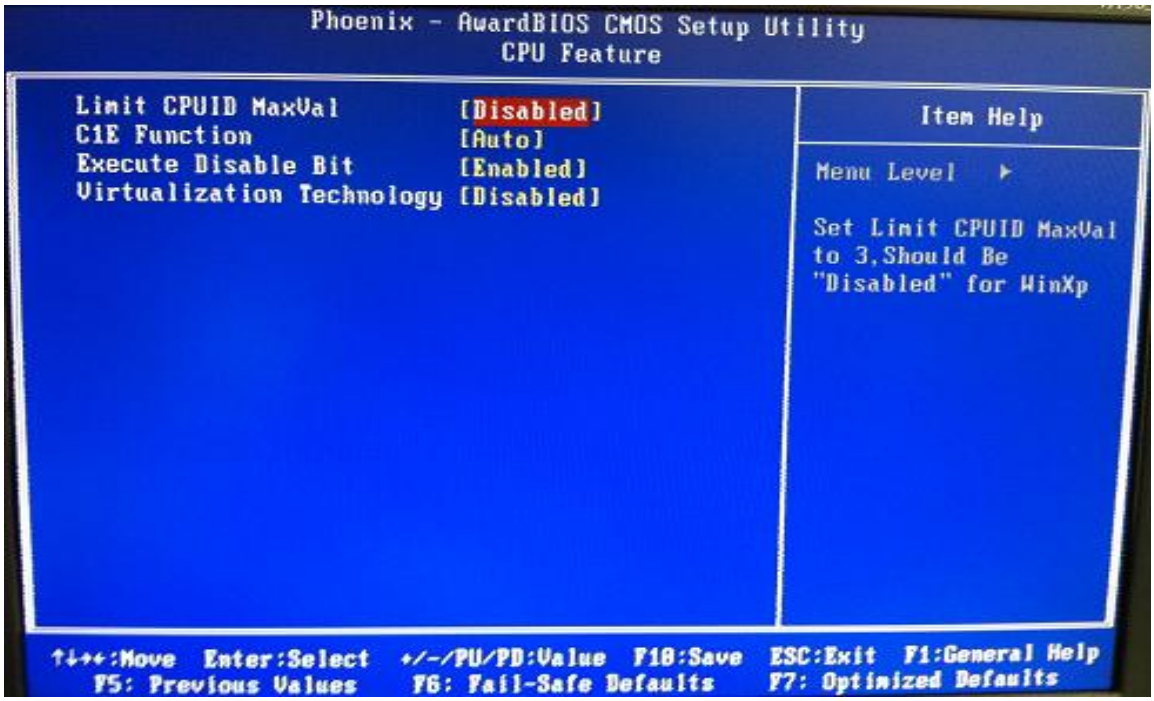


Further to save the selection (System will execute about 15 seconds)

Finally, please shut down the system, then re-boot it, the system will come back to your changed Optimized Default Select.

- **CPU Features**

Scroll to this item and press <Enter> to view the CPU Feature sub menu.



- **Harddisk boot priority**

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

- **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".

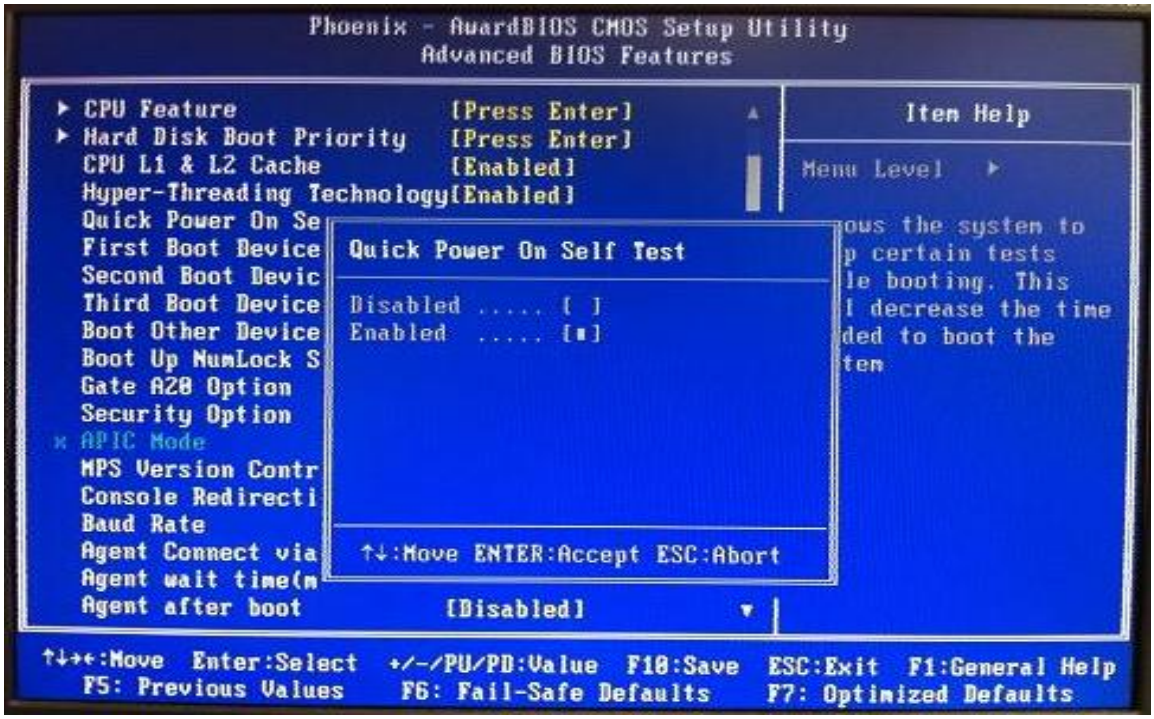
Enabled	Enable Quick POST
Disabled	Normal POST

- **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. There is a wide range of options for your selection.
- **Boot Other Device**
  This item allows the user to enable/disable the boot device not listed on 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".
- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is "Setup".

System
Setup

System System requires correct password before booting, and also before permitting access to the Setup page.

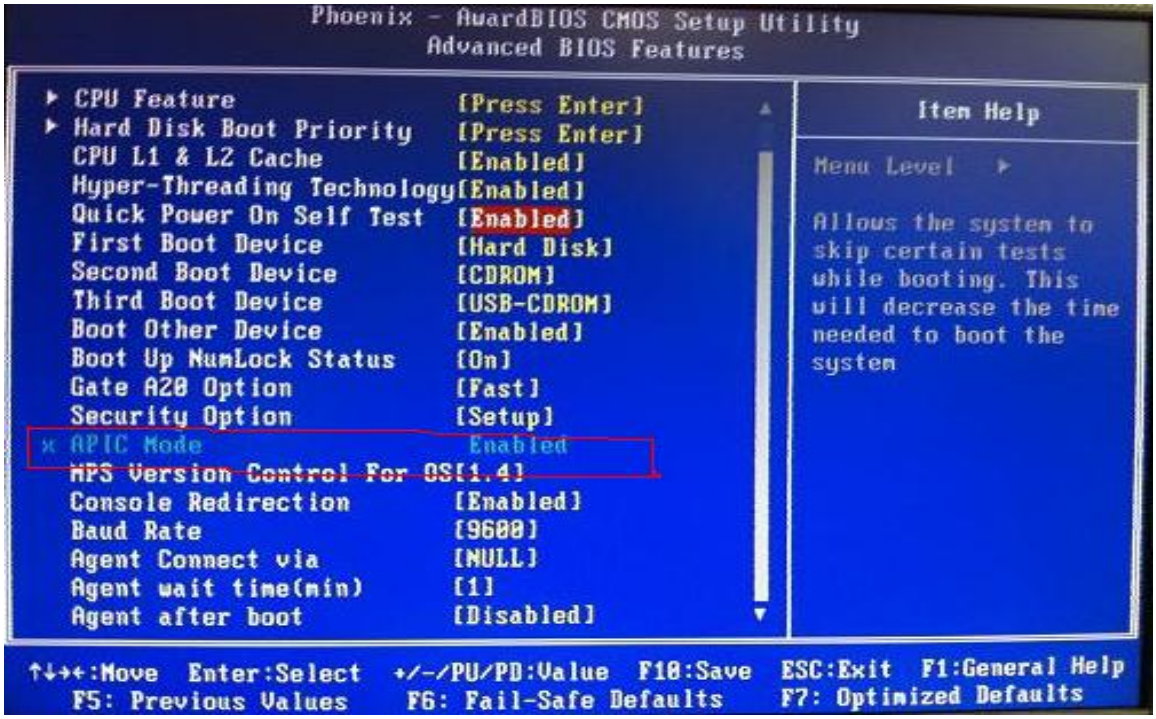
Setup System will boot, but requires correct password before permitting access to Setup. (Default value)



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**

APIC (Advanced Programmable Interrupt Controller) mode is *enabled* that provides symmetric multiprocessing (SMP) for systems.

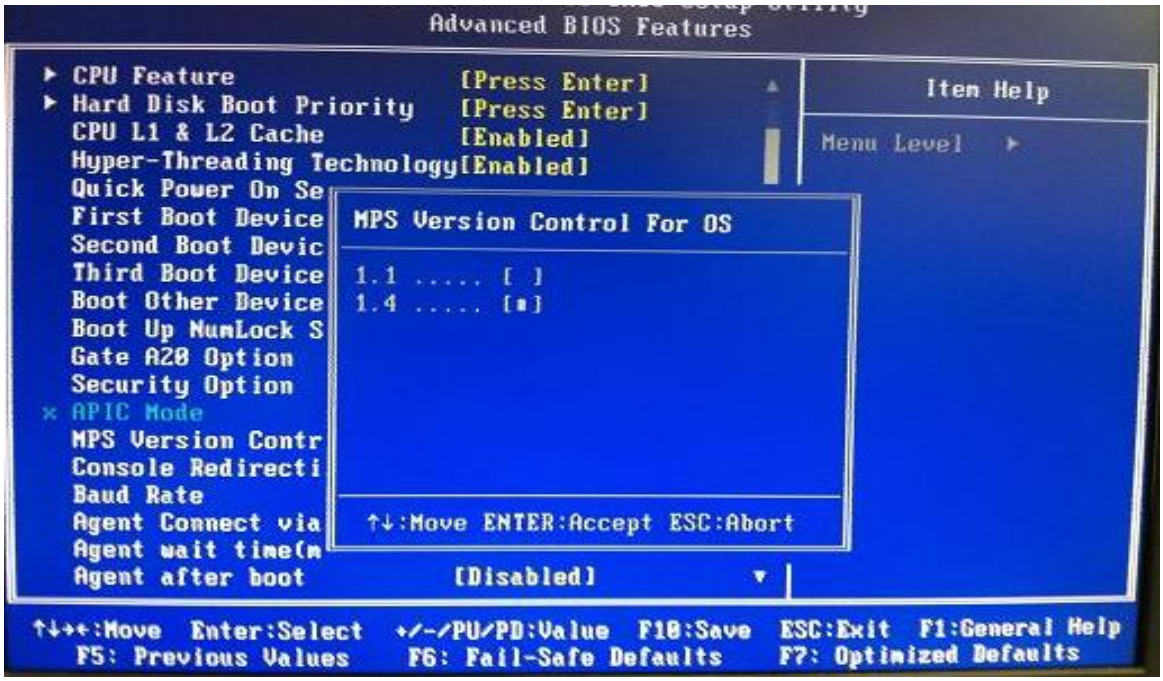


NOTE: APIC Mode has been locked and cannot be modified.

- **MPS Version Control For OS**

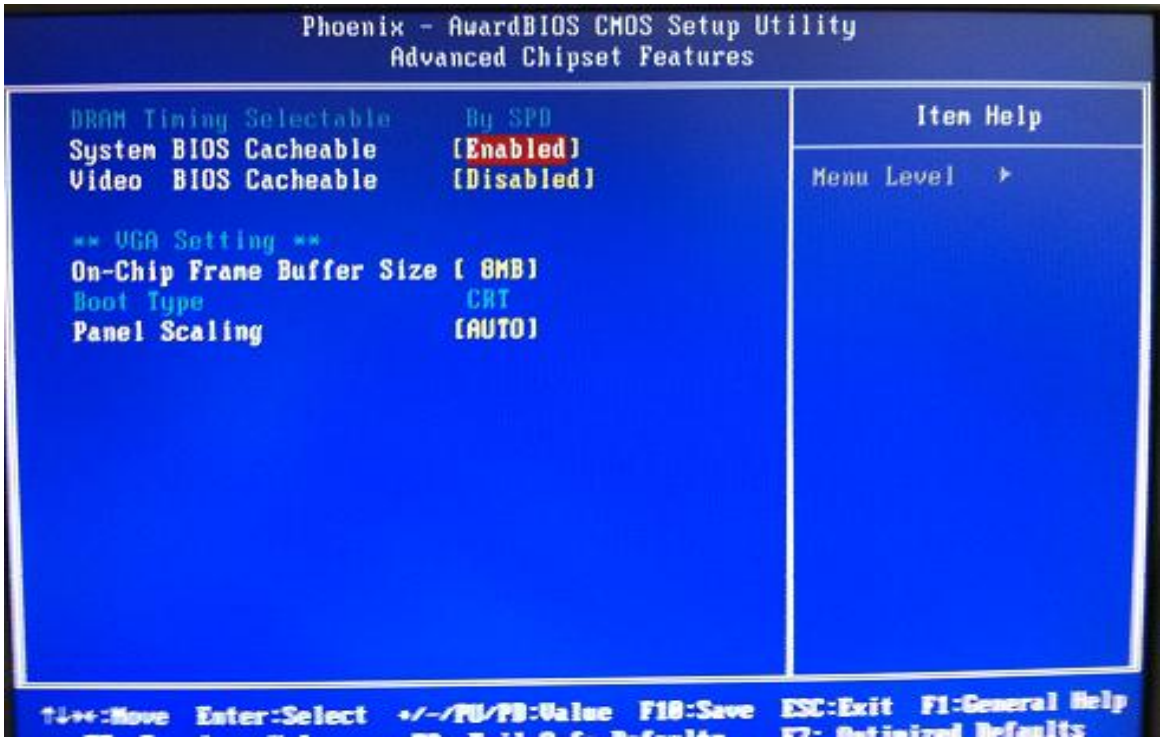
This item specifies the version of the Multiprocessor Specification (MPS). Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability.

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



3.7 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.

- **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.

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

- **On-Chip Frame Buffer Size**

Use this item to set the VGA frame buffer size.

- **Boot Type** (CRT Only)

This item is to select Display Device that the screen will be shown. But its default is CRT Only and cannot be modified.

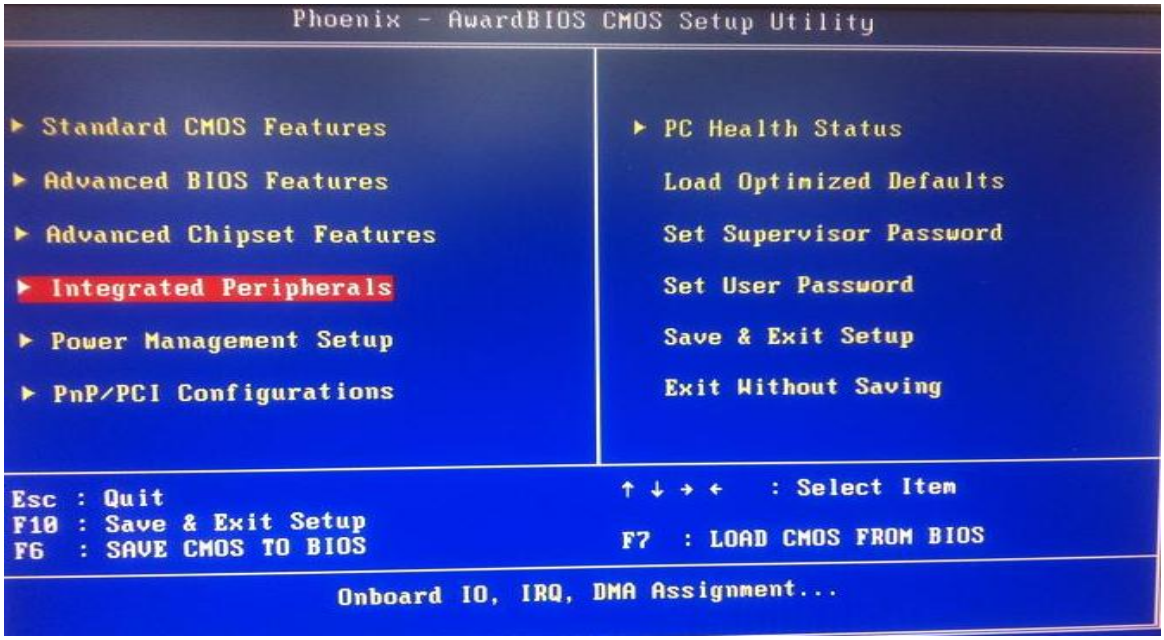
- **Panel Scaling** (AUTO by default)

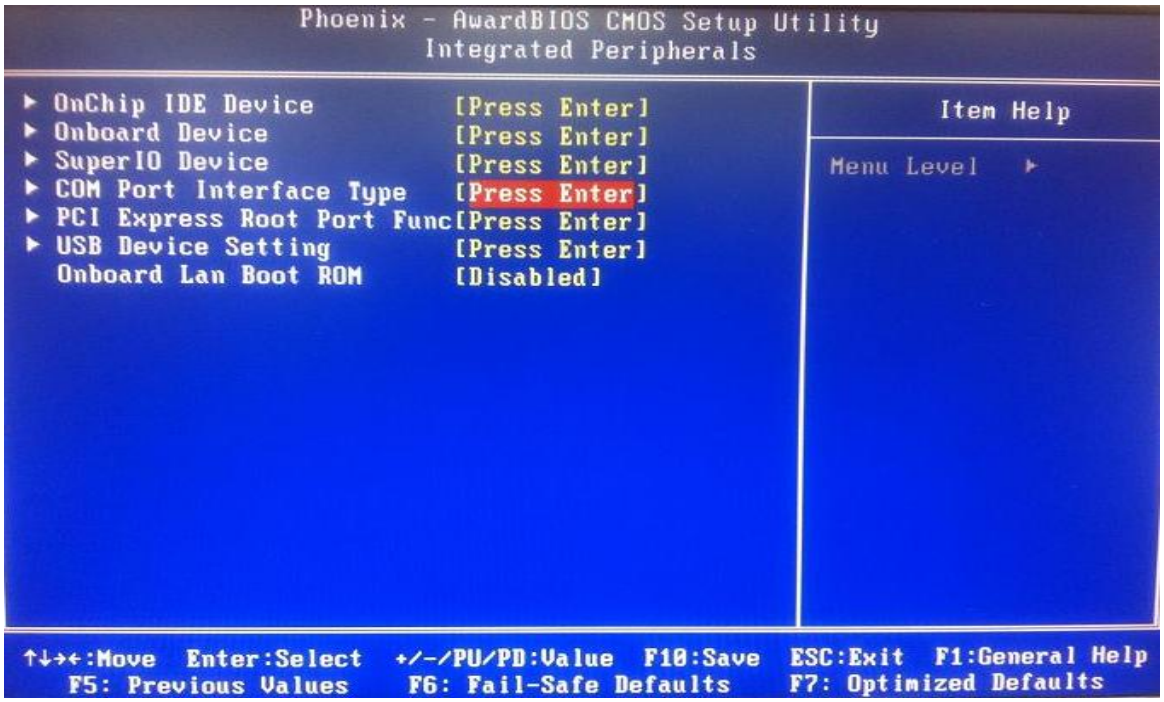
This item shows the setting of panel scaling and operates the scaling function that the panel output can fit the screen resolution connected to the output port. Its default is AUTO and cannot be modified.

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

3.8 Integrated Peripherals

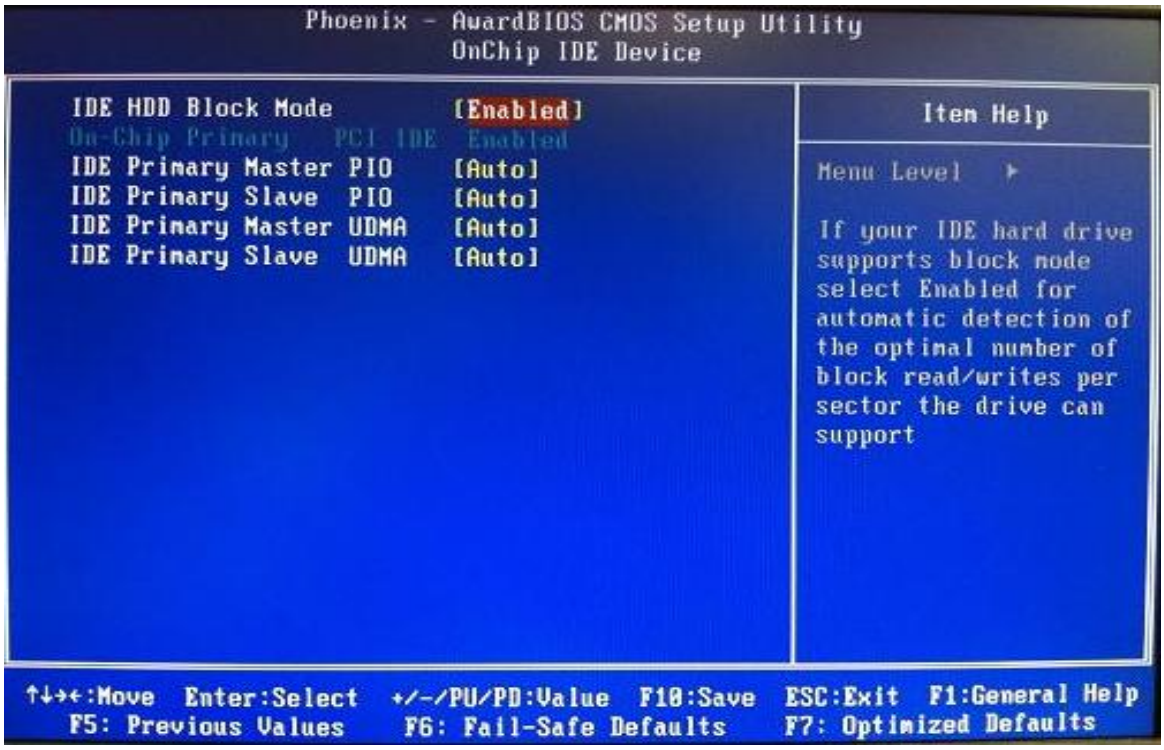
This section allows you to configure your OnChip IDE Device, Onboard Device, COM Ports Interface Type and USB Device Setting…





- **OnChip IDE Device**

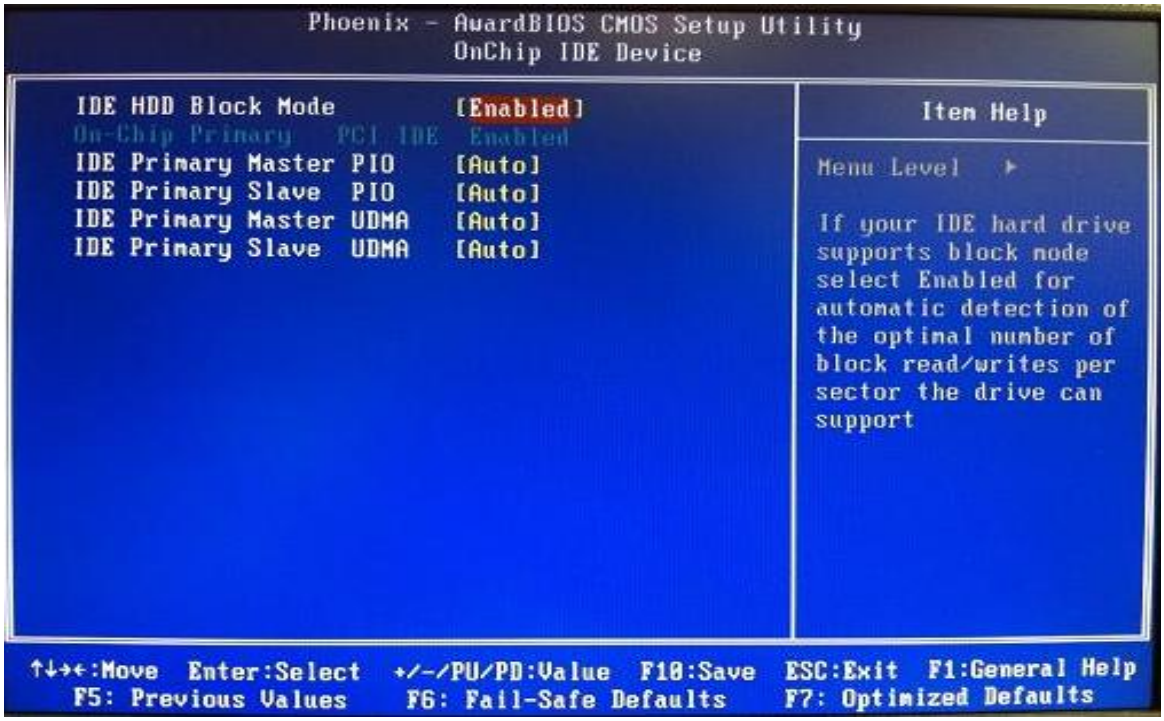
Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.



- **IDE HDD Block Mode**

  Block mode is also called block transfer, multiple commands, and ormultiple sectors 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.

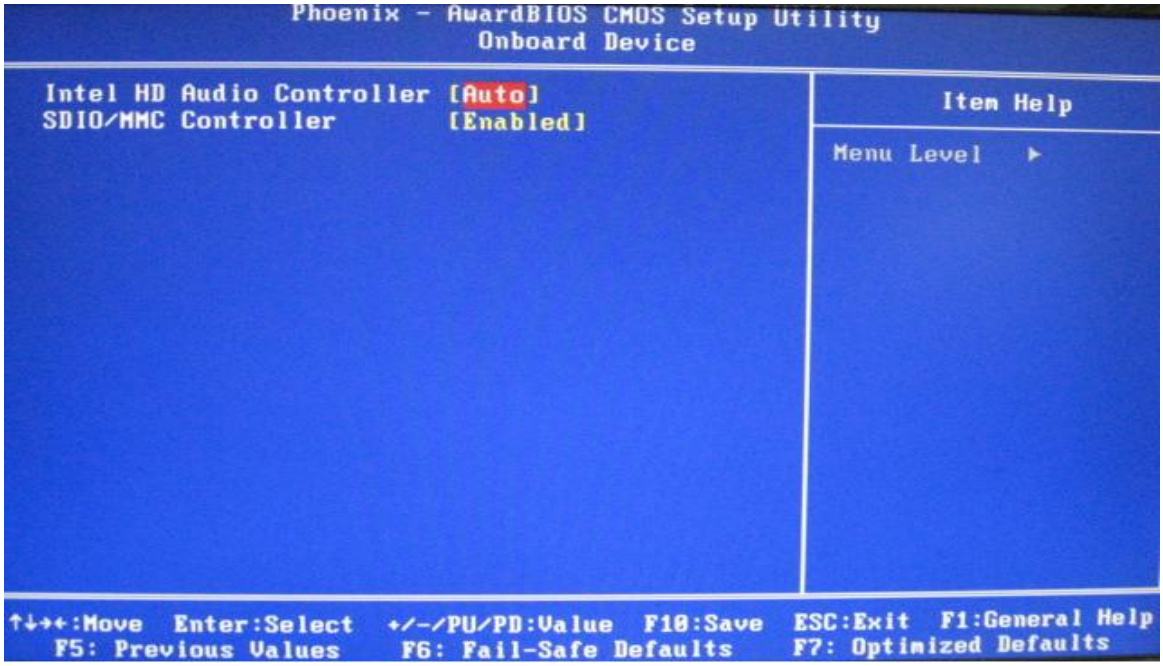
Press <Esc> to return to the Integrated Peripherals page.


Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
On-Chip Primary PCI IDE Enabled
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
Item Help
Menu Level ▸
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Onboard Device**

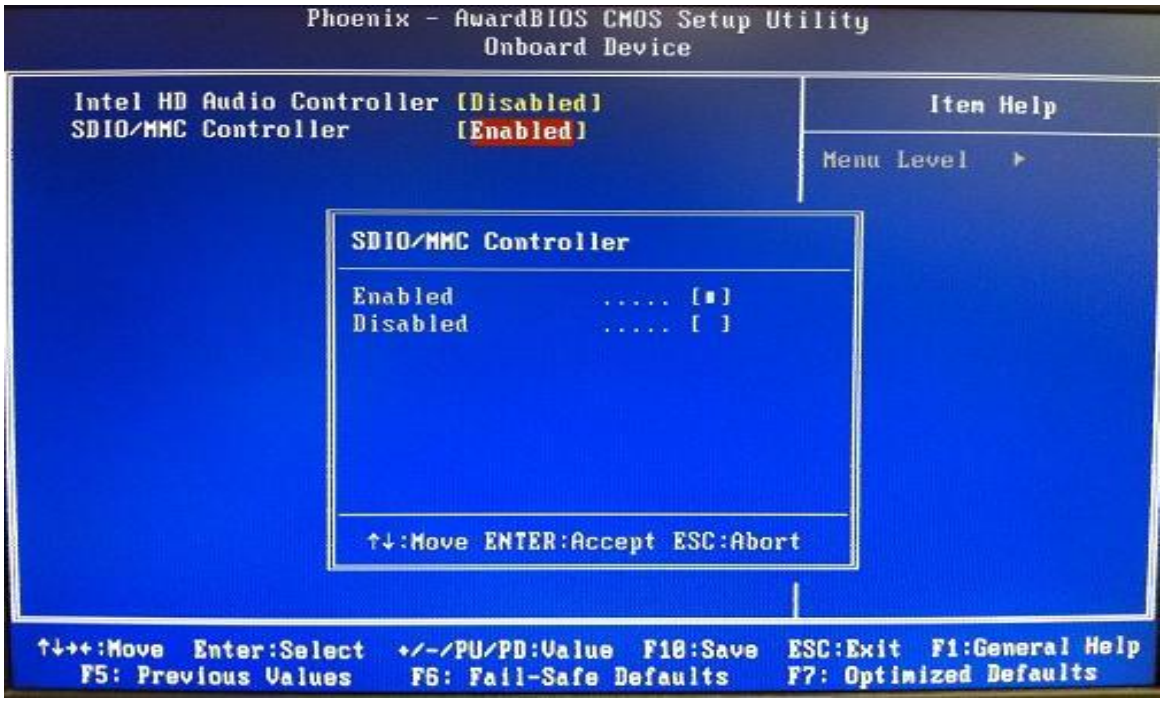
Scroll to this item and press <Enter> to view the sub menu Onboard Device.

➢ **Intel HD Audio Controller**
Choose Auto on the Intel HD Audio controller.



- **SDIO/MC Controller (Enabled)**

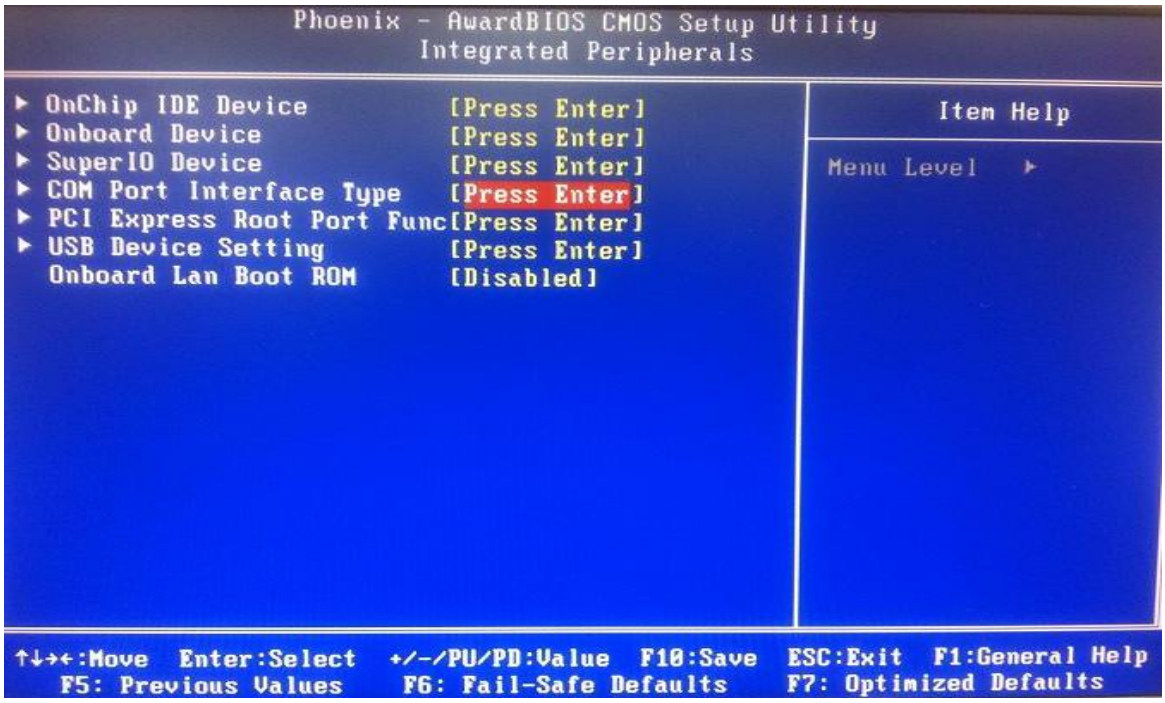
  Choose *Enabled* on the SDIO/MMC Controller

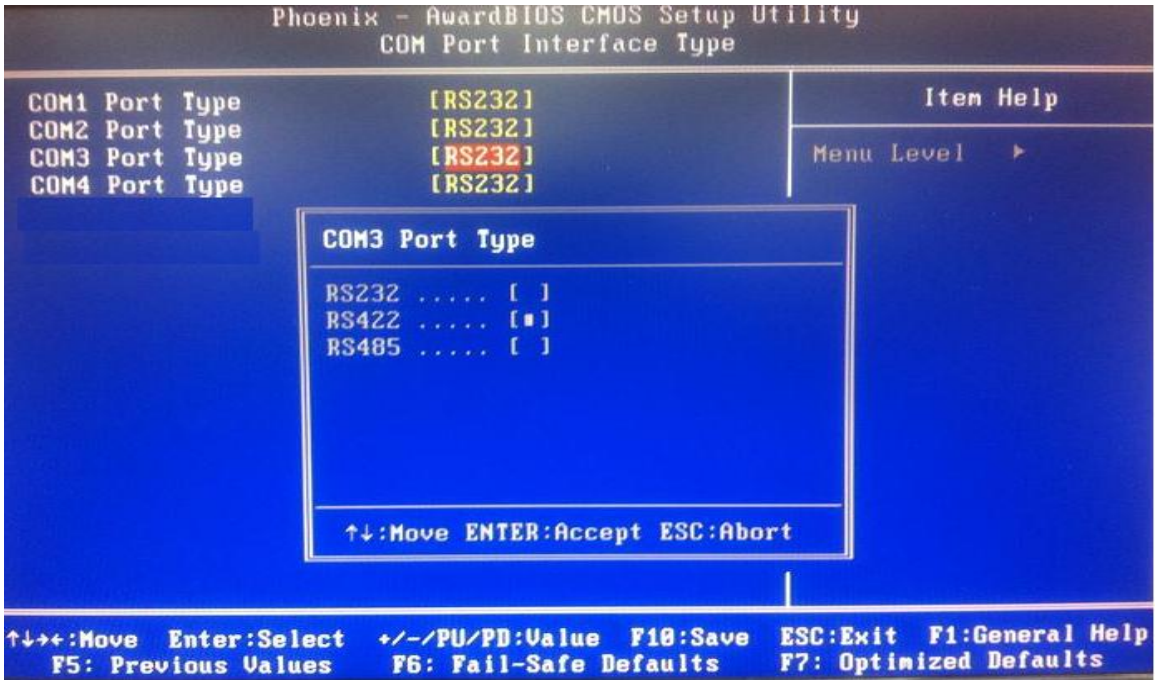


Press <Esc> to return to the Integrated Peripherals page.

- COM Port Interface Type

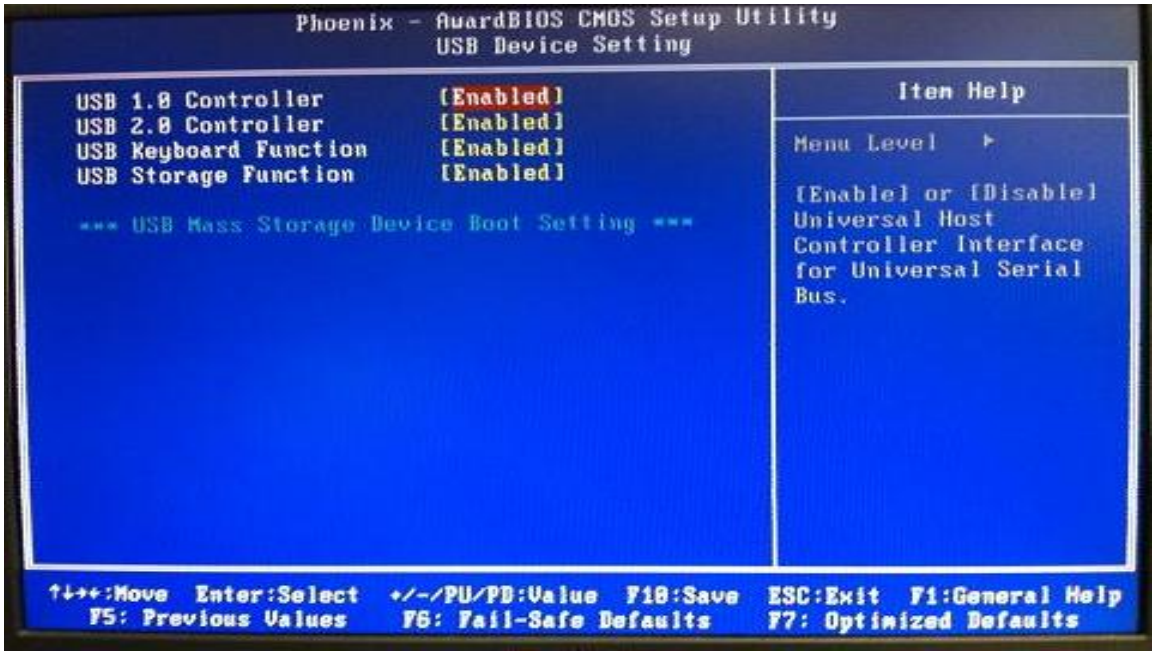
The default setting for all COM Ports are RS232, you can change the default setting by selecting the value you want in each COM Port Type.
Press <ESC> to return to the Integrated Peripherals page.




Phoenix - AwardBIOS CMOS Setup Utility
COM Port Interface Type
COM1 Port Type [RS232]
COM2 Port Type [RS232]
COM3 Port Type [RS232]
COM4 Port Type [RS232]
Item Help
Menu Level ▸
COM3 Port Type
RS232 ..... [ ]
RS422 ..... [•]
RS485 ..... [ ]
↑↓:Move ENTER:Accept ESC:Abort
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **USB Device Setting**

Scroll to this item and press <Enter> to view the sub menu USB Device Setting.
Press <Esc> to return to the Integrated Peripherals page.



- **Onboard Lan Boot ROM**

Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up. Its default is *disable*.

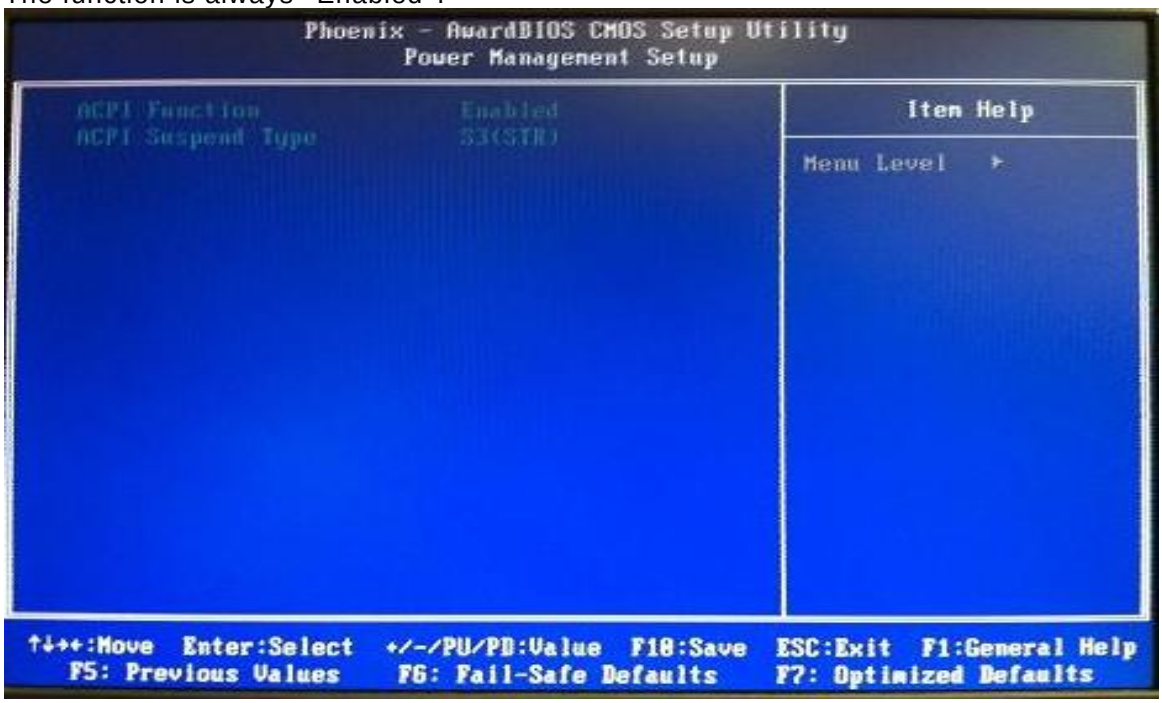
3.9 Power Management Setup

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.

- **ACPI Function**

Advanced Configuration and Power Management (ACPI).

The function is always "Enabled".

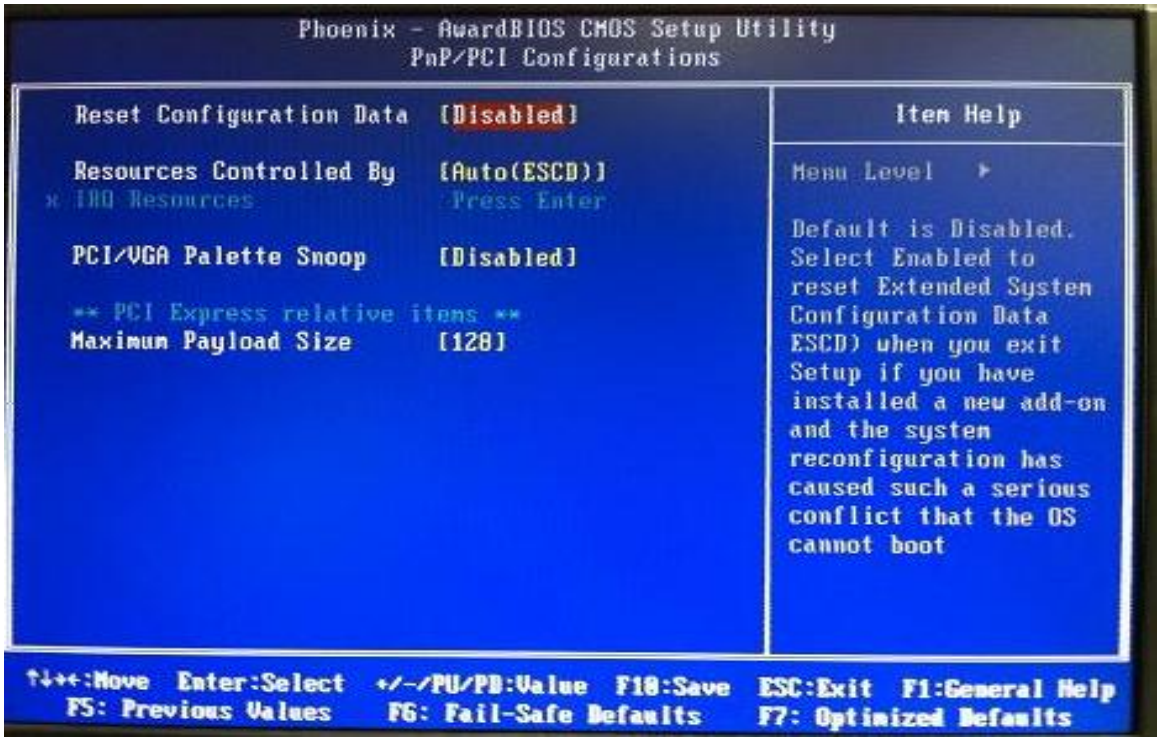


3.10 PnP/PCI Configuration Setup

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.

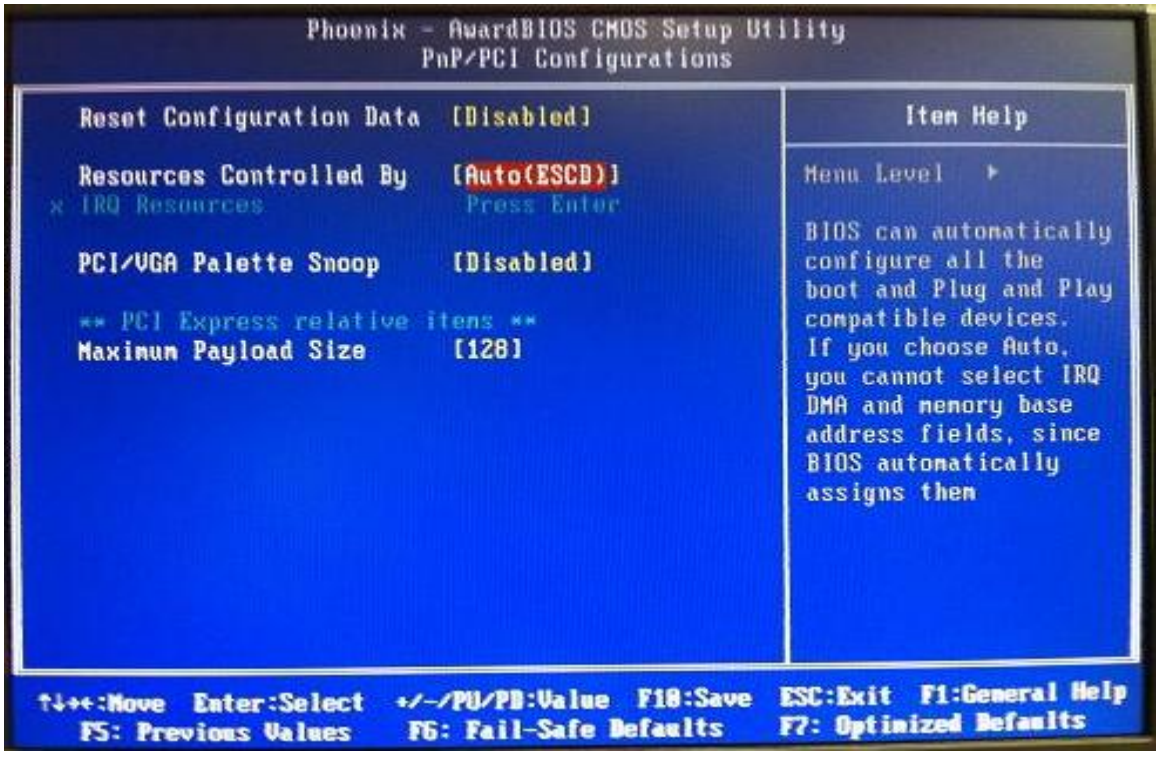
- **Reset Configuration Data**

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 assign them. The default value is *"Auto"*. The other option is "Manual"



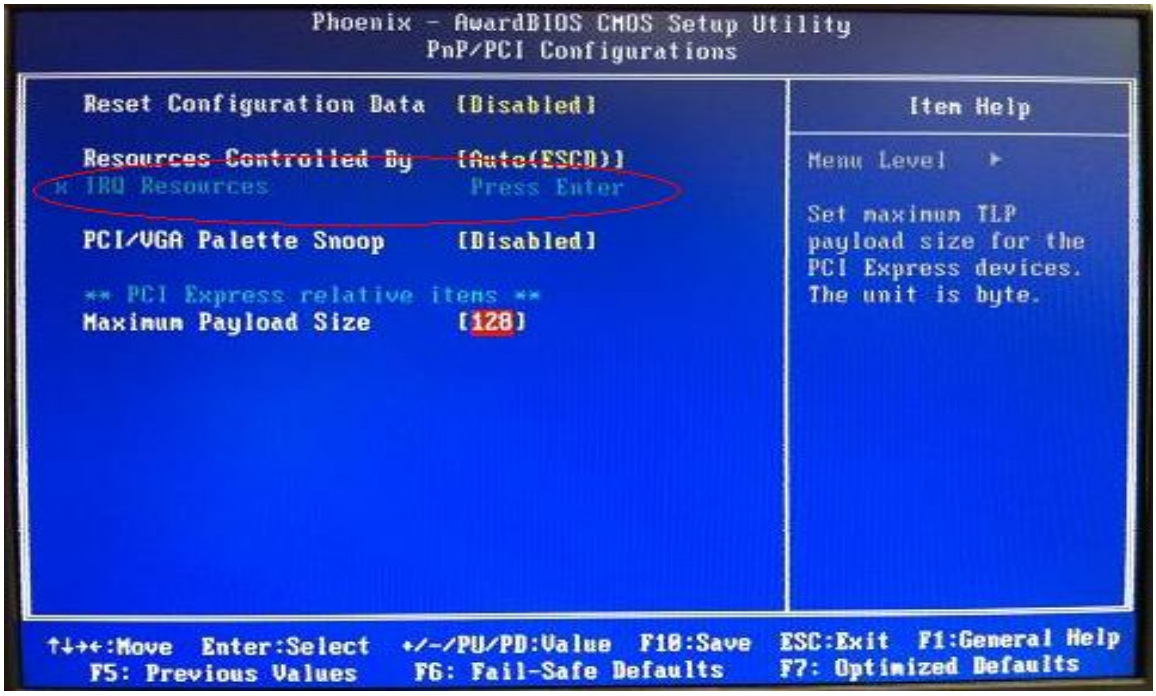

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette S
** PCI Express re
Maximum Payload S
Item Help
Menu Level ▸
S can automatically
figure all the
t and Plug and Play
patible devices.
you choose Auto,
cannot select IRQ
and memory base
ress fields, since
S automatically
igns them
Resources Controlled By
Auto(ESCD) ..... [*]
Manual ..... [ ]
↑↓:Move ENTER:Accept ESC:Abort
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **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,

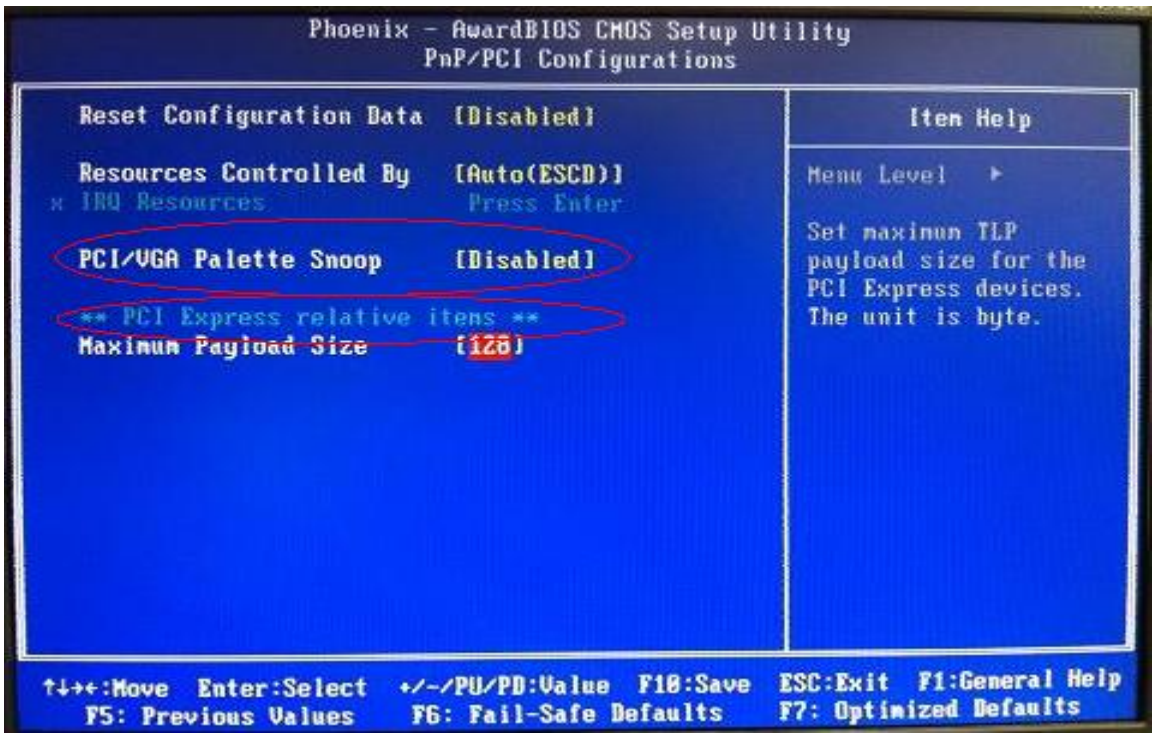
whether designed for PCI or ISA bus architecture.The default value is "PCI/ISA PnP".



- **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.

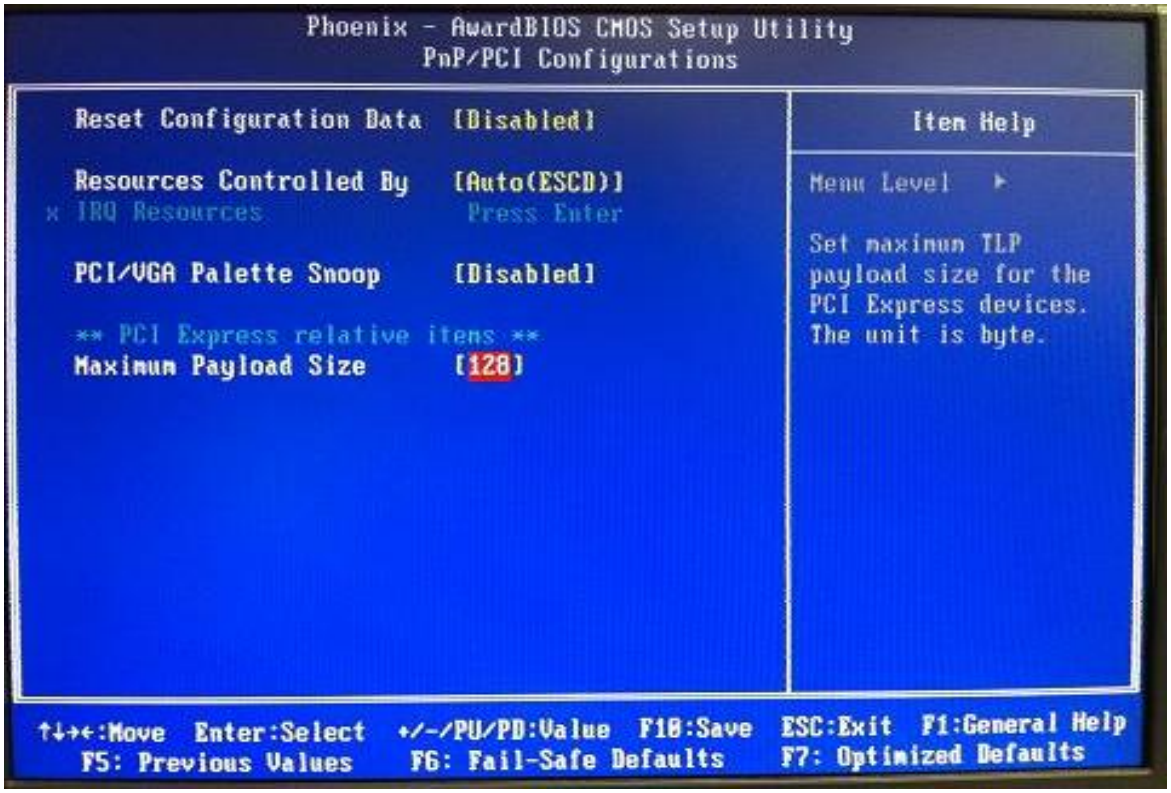
**** PCI Express relative items ****



- **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.

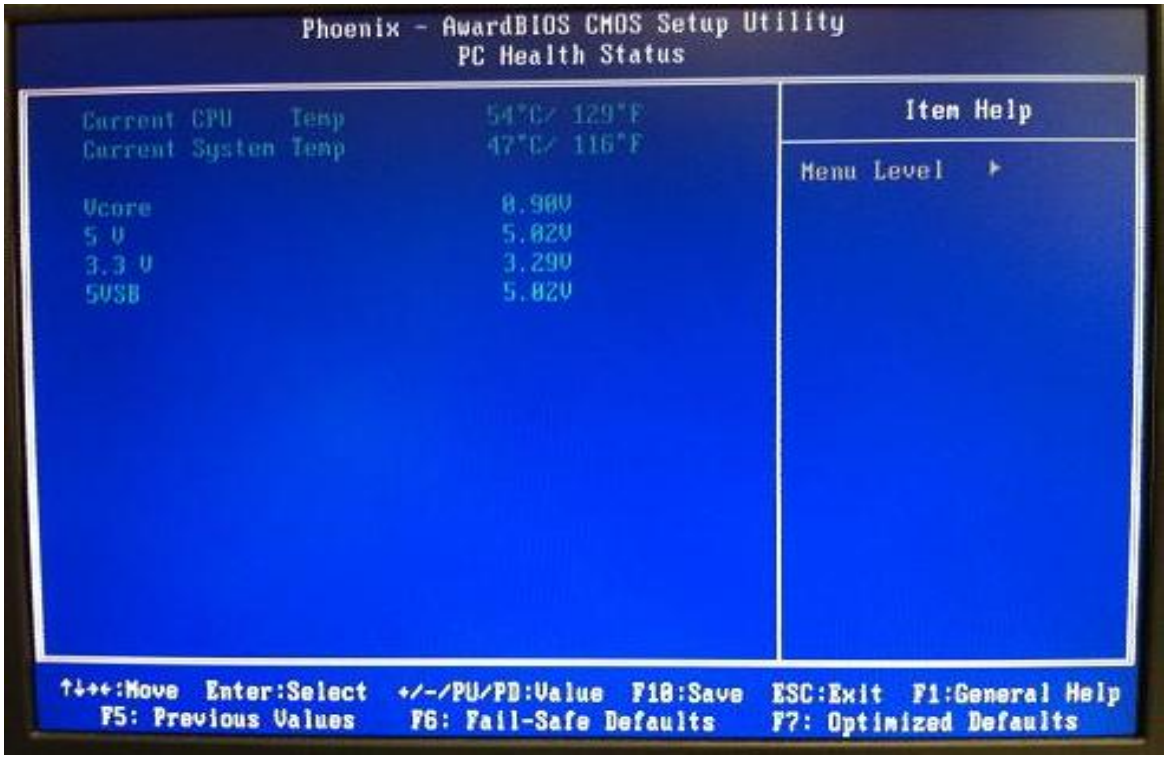
Press <Esc> to return to the Main Menu page.



3.11 PC Health Status

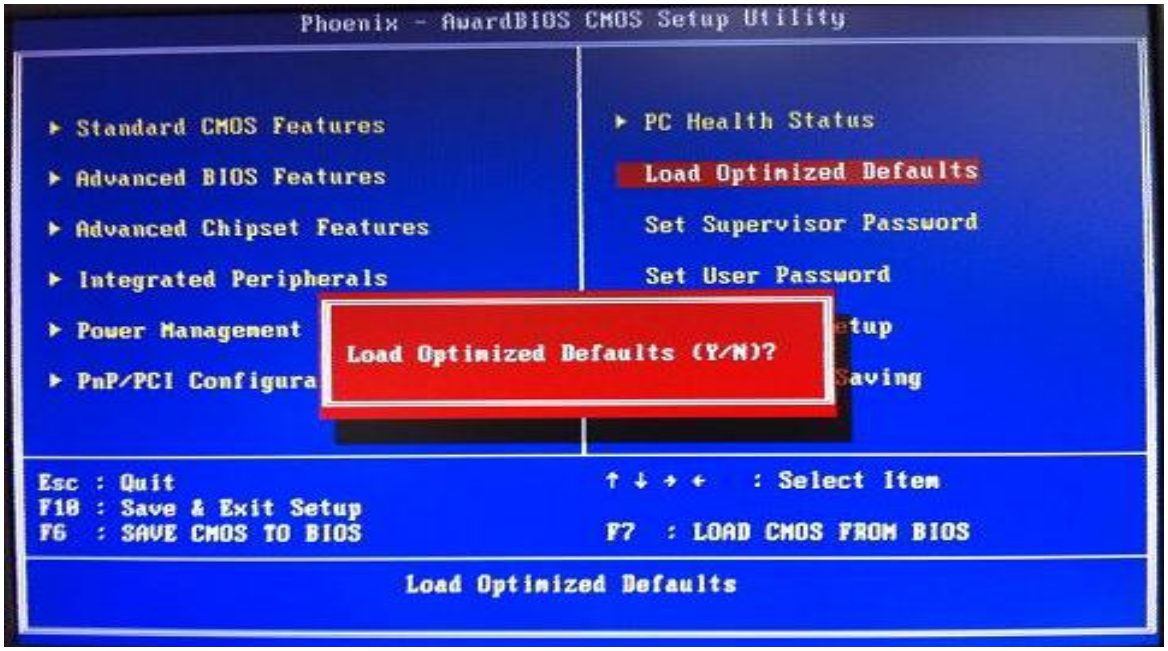
This section supports hardware monitoring that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.

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



3.12 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".

3.13 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.

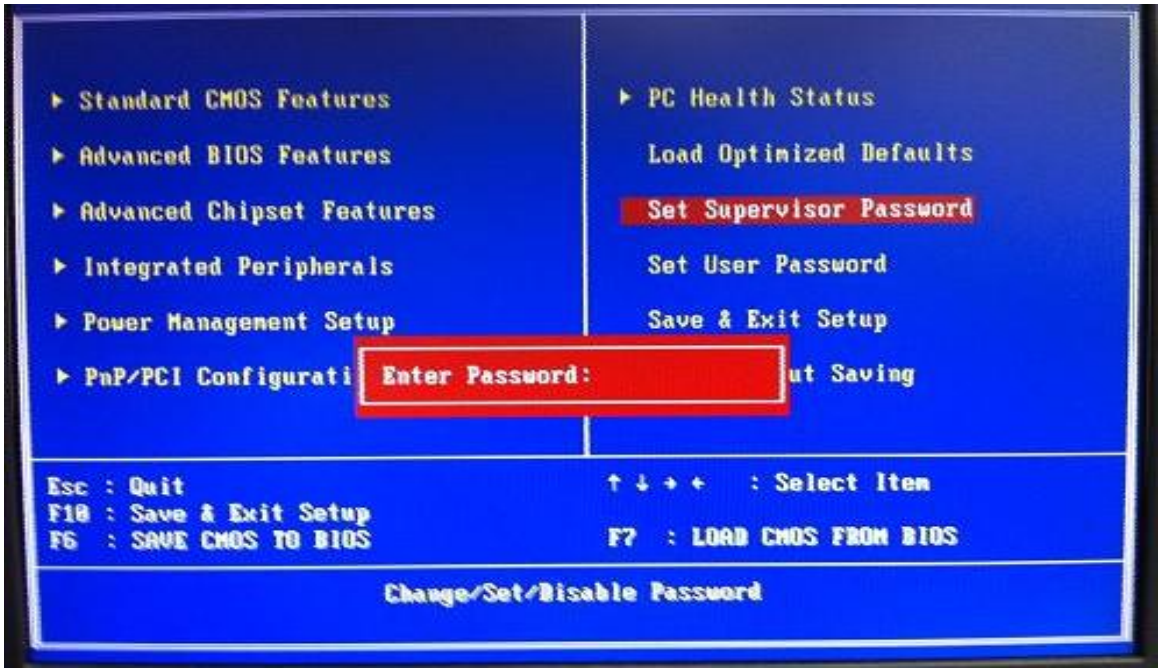
To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

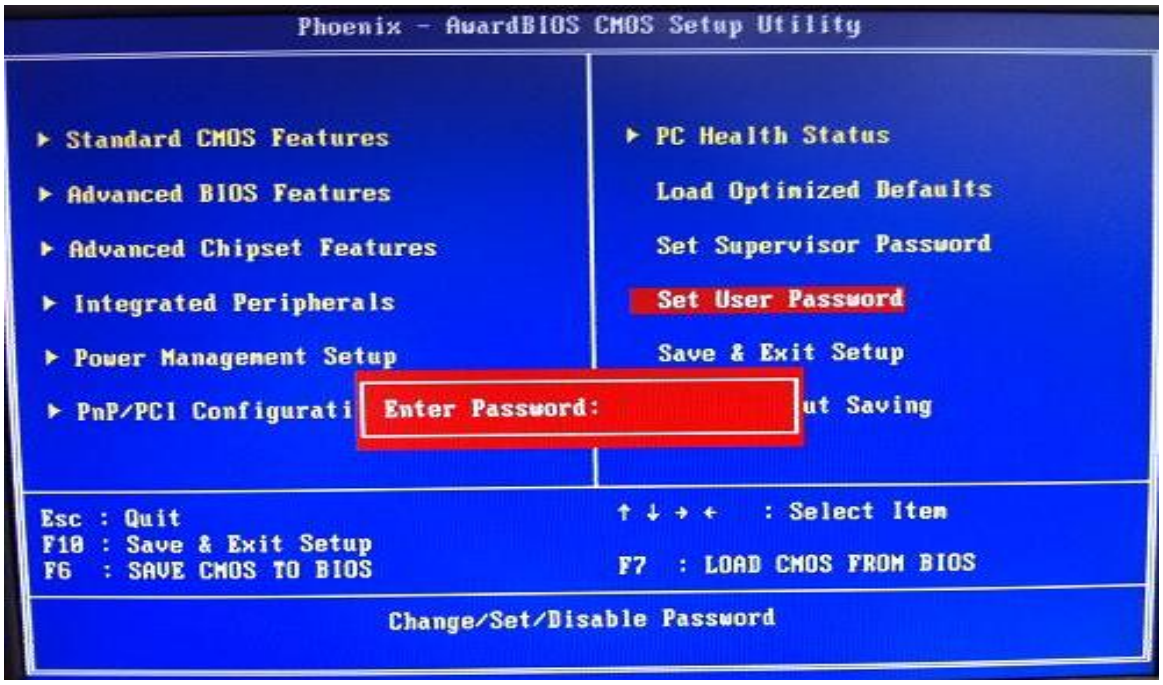
PASSWORD DISABLED

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.

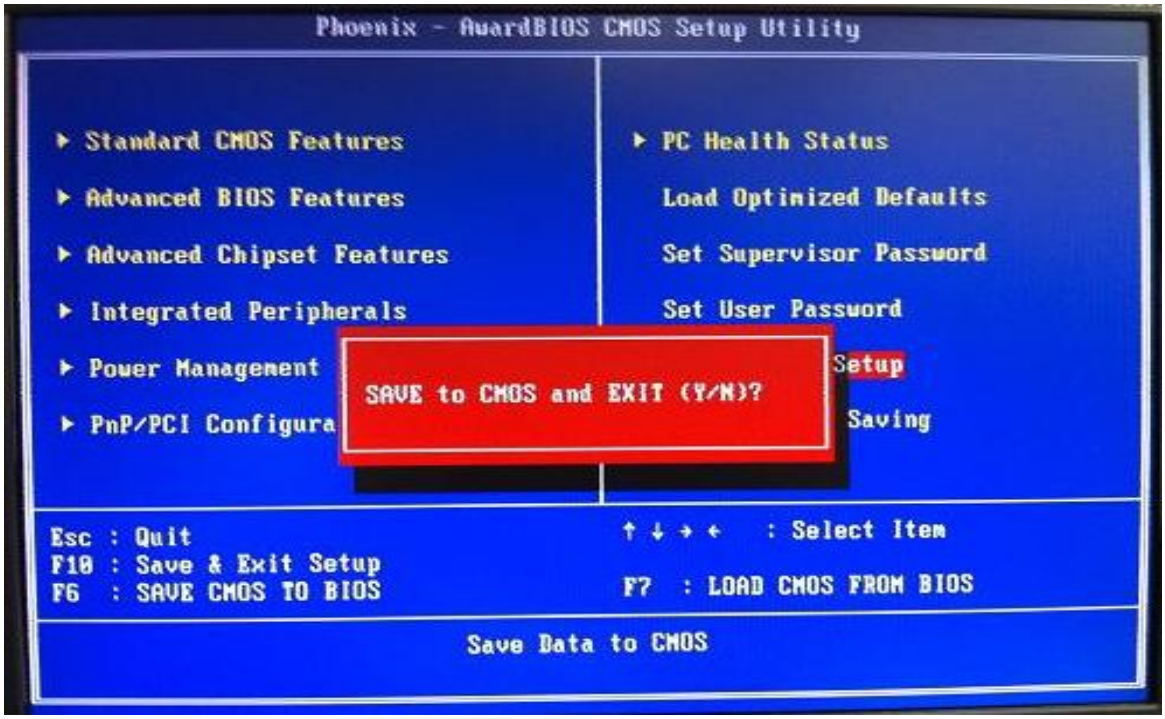
You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.


Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Peripherals
Power Management Setup
PnP/PCI Configurati
PC Health Status
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Enter Password:
ut Saving
Esc : Quit
F10 : Save & Exit Setup
F6 : SAVE CMOS TO BIOS
↑ ↓ → ← : Select Item
F7 : LOAD CMOS FROM BIOS
Change/Set/Disable Password


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Peripherals
Power Management Setup
PnP/PCI Configurati
PC Health Status
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Enter Password:
ut Saving
Esc : Quit
F10 : Save & Exit Setup
F6 : SAVE CMOS TO BIOS
↑ ↓ → ← : Select Item
F7 : LOAD CMOS FROM BIOS
Change/Set/Disable Password

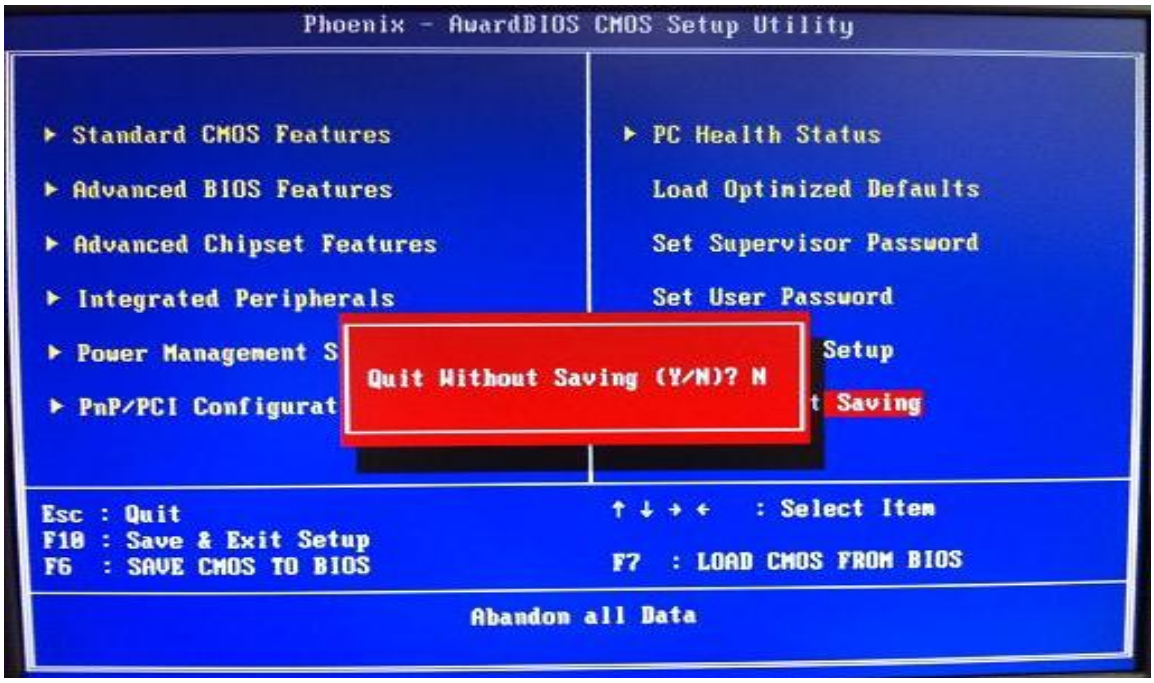
3.14 Save & Exit Setup

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 Previous Setup utility.



3.15 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 and come back to Previous Setup utility. Type "N" to return to the Setup utility.



,

** Notice **

Two graphics drivers, but only one can be installed in the system.

- **Windows XP GMA 500 driver**

The default setting of display output under Windows XP GMA 500 driver is LVDS port.

If you only connect VGA port to install driver, please press **"Ctrl+Alt+F1"** to switch the display output to VGA port.

- **Windows XP IEGD driver**

The default setting of display output is VGA port.