

V460 Series Hardware User's Manual

Fifth Edition, January 2010

www.moxa.com/product

MOXA®

© 2010 Moxa Inc. All rights reserved.
Reproduction without permission is prohibited.

V460 Series Hardware User's Manual

Any software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

Copyright Notice

Copyright © 2010 Moxa Inc.
All rights reserved.
Reproduction without permission is prohibited.

Trademarks

MOXA is a registered trademark of Moxa Inc.
All other trademarks or registered marks in this manual belong to their respective manufacturers.

Disclaimer

Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.

Moxa provides this document “as is,” without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.

Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.

This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

Technical Support Contact Information

www.moxa.com/support

Moxa Americas:

Toll-free: 1-888-669-2872

Tel: +1-714-528-6777

Fax: +1-714-528-6778

Moxa China (Shanghai office):

Toll-free: 800-820-5036

Tel: +86-21-5258-9955

Fax: +86-10-6872-3958

Moxa Europe:

Tel: +49-89-3 70 03 99-0

Fax: +49-89-3 70 03 99-99

Moxa Asia-Pacific:

Tel: +886-2-8919-1230

Fax: +886-2-8919-1231

Table of Contents

Chapter 1	Introduction	1-1
	Overview	1-2
	Package Checklist	1-2
	Product Features	1-3
	Product Hardware Specifications.....	1-4
	Hardware Block Diagrams.....	1-6
Chapter 2	Hardware Introduction.....	2-1
	Appearance	2-2
	Dimensions (unit = mm)	2-5
	LED Indicators.....	2-5
	Power On/Off Button	2-6
	Reset Button.....	2-6
	Real Time Clock	2-6
	Placement Options	2-7
	Wall or Cabinet	2-7
	DIN-Rail Mounting	2-7
Chapter 3	Hardware Connection Description	3-1
	Wiring Requirements	3-2
	Connecting the Power	3-2
	Grounding the Unit.....	3-3
	Connecting to a Display.....	3-3
	Connecting to a Keyboard and Mouse.....	3-4
	Connecting to the Network	3-5
	Connecting to a Serial Device.....	3-6
	Connecting to the unmanaged switch ports (V466 only).....	3-6
	PCMCIA (V462 only).....	3-6
	Connecting to the DI/DO (V468 only).....	3-6
	Digital Input Wiring	3-7
	Digital Output Wiring	3-7
	Installing a Memory Module	3-7
	Inserting a CompactFlash Card.....	3-8
	USB Hosts	3-10
	Audio Interface	3-10
Chapter 4	BIOS Setup	4-1
	Entering the BIOS Setup Utility	4-2
	Modifying the BIOS Main Settings	4-2
	Basic Configuration.....	4-2
	System Security.....	4-3
	Advanced Settings	4-4
	Removable Device/Hard Disk/Cd-ROM Boot Priority.....	4-4
	First / Second / Third Boot Device.....	4-4
	Boot Other Device.....	4-4
	Modifying Advanced BIOS Settings.....	4-5
	Advanced Chipset Settings.....	4-6
	PnP/PCI Configurations	4-8
	Peripherals	4-9

Power	4-11
Hardware Monitor.....	4-12
Load Defaults.....	4-13
Exiting the BIOS Setup.....	4-14
Upgrading the BIOS	4-14

Thank you for purchasing the Moxa V460 series x86-based industrial ready-to-run embedded computer. This product's features include RS-232/422/485 serial ports, dual or quad 10/100 Mbps Ethernet ports, VGA output, a CompactFlash socket for mass storage expansion, PS/2 connector for keyboard/mouse usage, four USB 2.0 ports that support system boot, mass storage disk expansion, or other peripherals, 8 digital input channels and 8 digital output channels, and input channels with 3 KV protection (V468), 8 10/100 Mbps unmanaged switch ports (V466), and PCMCIA slot (V462). The V460 series is based on the AMD low power consumption solution, which makes it suitable for various industrial and harsh applications such as SCADA, factory automation, and applications that require an onsite display or monitor. The x86 architecture and friendly Windows embedded platform provide an integrated powerful tool for handling data. The V460 can be used as a field host and control center for on-site applications that transfer or relay information.

This manual introduces the hardware of the V460 series embedded computers. After a brief introduction of the hardware features, the manual focuses on installation and hardware configuration with device interfaces.

In this chapter, we cover the following topics:

- Overview**
- Package Checklist**
- Product Features**
- Product Hardware Specifications**
- Hardware Block Diagrams**

Overview

The V460 series of x86 ready-to-run embedded computers is designed around the AMD LX800 and Geode chipset, which exhibits low power consumption and high reliability. In addition to the usual computer peripherals, the V460 integrates dual or quad LAN ports, 4 USB 2.0 hosts, and 4 serial ports, making the V460 into an ideal industrial embedded computer for handling not only communication tasks, but also applications that require advanced computing power. In addition, all output and information can be displayed onscreen through the built-in VGA interface. The V460 series offers a variety of I/O options for use in a variety of applications and vertical markets.

The on-board CompactFlash and DDR SDRAM provide ample storage capacity, and the Windows-based operating system comes pre-installed and ready-to-run, providing a Windows-like environment for easy software development. Software written for desktop PCs can be easily ported to the V460 using a common compiler, which means that programmers do not need to spend a lot of time modifying existing software code. In addition, the operating system, device drivers, and user-developed software can all be stored in the pre-installed CompactFlash memory Card to enhance system reliability.

Package Checklist

V462-CE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Dual LANs, 4 Serial Ports, CompactFlash, PCMCIA, USB, Audio, WinCE 6.0.

V464-CE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, CompactFlash, USB, Audio, WinCE 6.0.

V466-CE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, 8 Unmanaged Switch Ports, CompactFlash, USB, Audio, WinCE 6.0.

V468-CE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, 8DI, 8DO, CompactFlash, USB, Audio, WinCE 6.0.

V462-XPE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Dual LANs, 4 Serial Ports, CompactFlash, PCMCIA, USB, Audio, WinXP embedded.

V464-XPE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, CompactFlash, USB, Audio, WinXP embedded.

V466-XPE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, 8 Unmanaged Switch Ports, CompactFlash, USB, Audio, WinXP embedded.

V468-XPE

x86 Ready-to-Run Embedded Computer with AMD LX 800, VGA, Quad LANs, 4 Serial Ports, 8DI, 8DO, CompactFlash, USB, Audio, WinXP embedded.

All models of the V462/464/466/468 series are shipped with the following items:

- 1 V460 Series Embedded Computer
- Quick Installation Guide
- Document & Software CD
- Ethernet Cable: RJ45 to RJ45 cross-over cable, 100 cm
- PS2 to KB/MS Y type Cable
- Din-rail Kit
- Product Warranty Statement

Optional Accessories

Switching Power Adaptor: 60W, 24 VDC output, 100 to 240 VAC input, power cord must be ordered separately.

- Power Cords:
 - Power cord with Australia Plug
 - Power Cord with UK Plug
 - Power Cord with Euro Plug
 - Power Cord with US Straight Plug

NOTE: *Notify your sales representative if any of the above items are missing or damaged.*

Product Features

- AMD Geode LX 800@0.9W CPU, 500 MHz
- Built-in 256 MB DDR SDRAM (512MB for XPE version)
- Built-in 256 MB Industrial DOM to store OS (1GB for XPE version)
- 256K battery backup SRAM
- 2 RS-232 and 2 RS-232/422/485 serial ports
- Serial port 3 and port 4 support non-standard baudrates
- 2 or 4 10/100 Mbps Ethernet ports for network redundancy
- 8 unmanaged switch ports
- 8 + 8 DI/DO with 3 KV isolation protection
- CompactFlash socket for storage expansion
- 4 USB 2.0 hosts that support system boot up
- LED indicators for Power, Battery, Storage
- Ready-to-run WinCE 6.0 or XP embedded platform
- Din-rail and Wall mount installation supported
- Robust, fanless design

Product Hardware Specifications

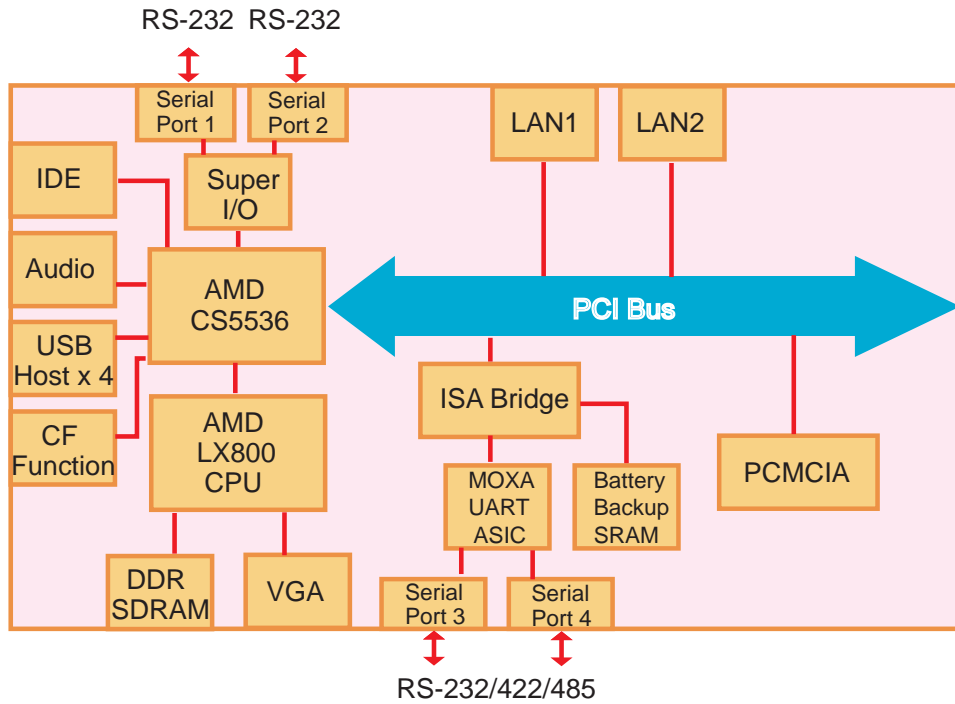
System	
CPU	AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz
System Chipset	AMD CS5536 chipset
FSB	400 MHz
Expansion Bus	On-board PC/104-Plus
BIOS	4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2
System Memory	200-pin SO-DIMM socket x 1 with built-in 256 MB DDRSupport DDR400 up to 1GB
SRAM	256K SRAM, battery backup
OS	Windows CE 6.0, WindowsXP Embedded
Display	
Graphics Controller	CPU Integrated 2D graphics
Display Interface	CRT Interface for VGA output
Network Communication	
LAN	V462: Auto-sensing 10/100 Mbps x 2, RJ45 connector V464: Auto-sensing 10/100 Mbps x 4, RJ45 connector V466: Auto-sensing 10/100 Mbps x 4, RJ45 connector V468: Auto-sensing 10/100 Mbps x 4, RJ45 connector
LAN Controller	Realtek RTL8100C
Protection	Built-in 1.5KV magnetic isolation protection
Serial Communication	
Serial Ports	Ports 1 and 2: RS-232, DB9 male Ports 3 4: RS-232/422/485, software-selectable, DB9 male RS-232 signals: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND RS-422 signals: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w signals: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w signals: Data+, Data-, GND
Protection	Built-in 15 KV ESD protection for all signals
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF, RS-485 ADDC™
Speed	50 bps to 921.6 Kbps; ports 3 and 4 support non-standard baudrates
Connector Type	D-Sub male 9-pin connector
Unmanaged Switch Communication (V466 only)	
Switch Port	Unmanaged 10/100 Mbps switch ports x 8
Digital Input (V468 only)	
Input Channels	8, source type
Digital input levels	Dry contact: Logic level 0: Close to GND Logic level 1: Open Wet contact:

	Logic level 0: +3V max Logic level 1: +10 to +30V (COM to DI)
Protection	3 KV optical isolation protection
Connector Type	10-pin screw terminal block (8 points / COM / GND)
Digital Output (V468 only)	
Output Channels	8, sink type
On-state Voltage	24 VDC nominal, open collector to 30 V
Output Current Rating	Max. 200 mA per channel
Protection:	3 KV optical isolation protection
Connector Type	9-pin screw terminal block
Other Peripherals	
USB	USB 2.0 compliant hosts x 4, type A connector, supporting system boot up
Audio	AC97 audio, supporting speaker-out interface
KB/MS	1 PS/2 interface supporting standard PS/2 keyboard and PS/2 mouse via Y-type cable
Watchdog Timer	Supports 1 to 255 level time interval system reset, software programmable
RTC	Comes with battery backup
PCMCIA	Cardbus card and 16-bit PCMCIA 2.1/ JEIDA 4.2 card (V462 only)
LEDs	
System	Power x 1, Ready x 1, Storage x 1
LAN	V462: 10M/Link x 2 (on connector), 100M/Link x 2 (on connector) V464: 10M/Link x 4 (on connector), 100M/Link x 4 (on connector) V466: 10M/Link x 4 (on connector), 100M/Link x 4 (on connector) V468: 10M/Link x 4 (on connector), 100M/Link x 4 (on connector)
Power Requirements	
Power Input	9 to 36 VDC, 3-pin terminal block (V+, V-, SG)
Power Consumption	2820 mA @ 36V, 730 mA @ 9V
Physical Properties	
Board Form Factor	EPIC
Dimensions (WxDxH):	260 x 135 x 50 mm (without wall mount kit)
Weight	1.36 kg
Construction Material	Aluminum
Mounting Options	DIN-rail, wall mounting
Environmental Limits	
Operating Temperature	-10 to 60°C (14 to 140°F), 5 to 95% RH
Storage Temperature	-20 to 80°C (-4 to 176°F), 5 to 95% RH
Anti-Vibration	5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr/axis
Anti-Shock	50 g @ IEC-68-2-27, half sine wave, 11 ms
Regulatory Approvals	
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

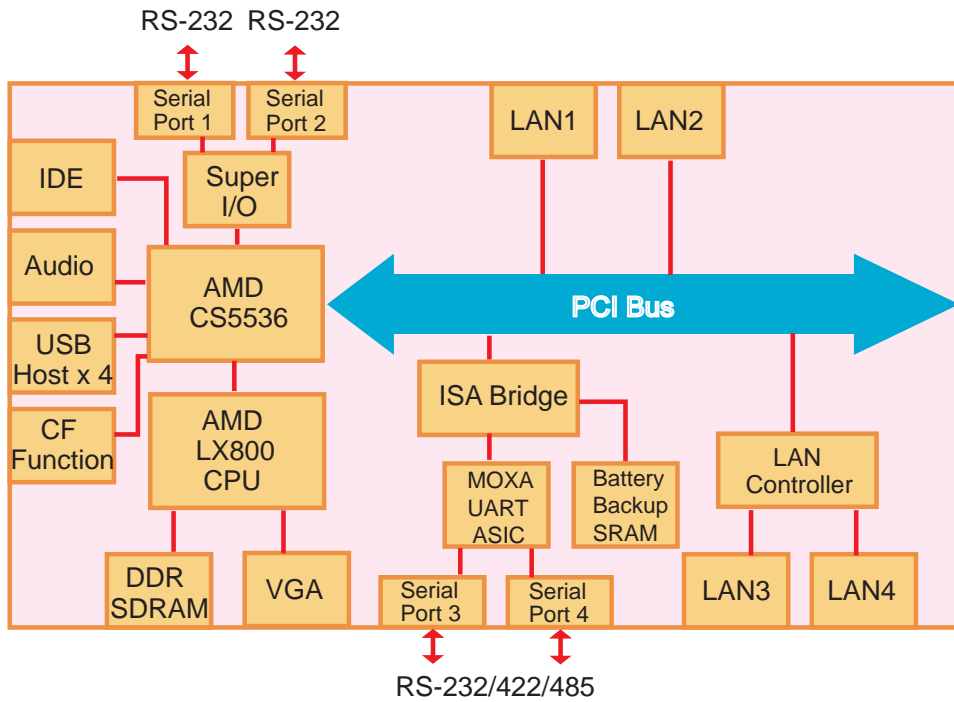
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)
Other	RoHS, WEEE
Warranty	3 years

Hardware Block Diagrams

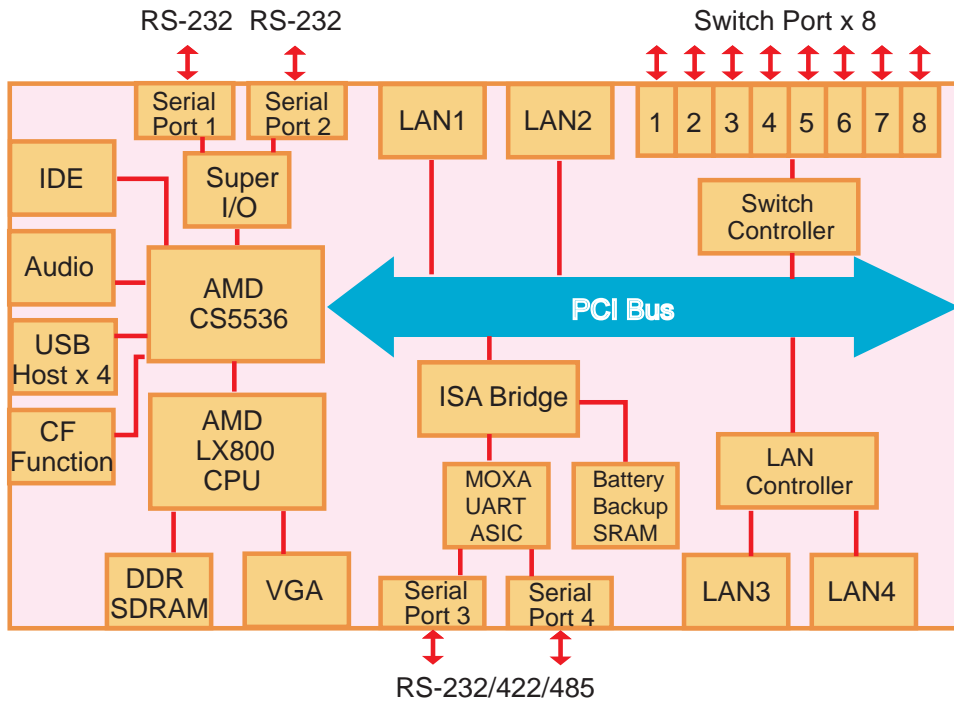
V462



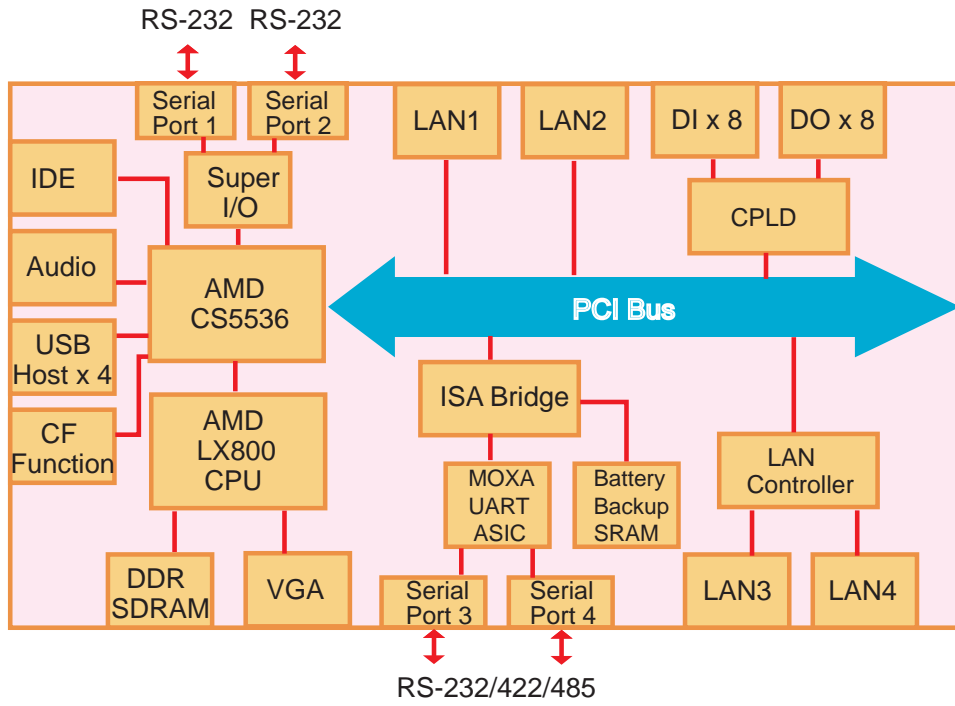
V464



V466



V468



Hardware Introduction

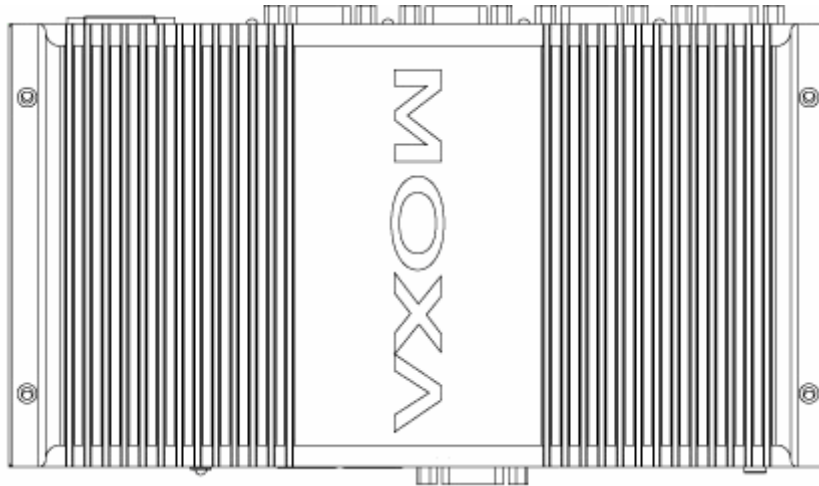
The V460 embedded computers are compact and rugged, making them suitable for industrial applications. The LED indicators allow users to monitor performance and identify trouble spots quickly, the multiple serial ports can be used to connect a variety of devices, the PCMCIA slot (V462) can be used for a variety of applications, the 8 switch ports (V466) can be used to connect different nodes via Ethernet to enlarge your automation network scope, and the 8+8 DI/DO (V468) enables the embedded computer to be used as an on-site center to gather signals and alarms from field equipment and convert protocols to ease the loading on other management nodes.

The V460 computers have a reliable and stable hardware platform that lets you devote the bulk of your time to application development. In this chapter, we provide basic information about the embedded computer's hardware and its various components. The following topics are covered:

- ❑ **Appearance**
- ❑ **Dimensions (unit = mm)**
- ❑ **LED Indicators**
- ❑ **Power On/Off Button**
- ❑ **Reset Button**
- ❑ **Real Time Clock**
- ❑ **Placement Options**
 - Wall or Cabinet
 - DIN-Rail Mounting

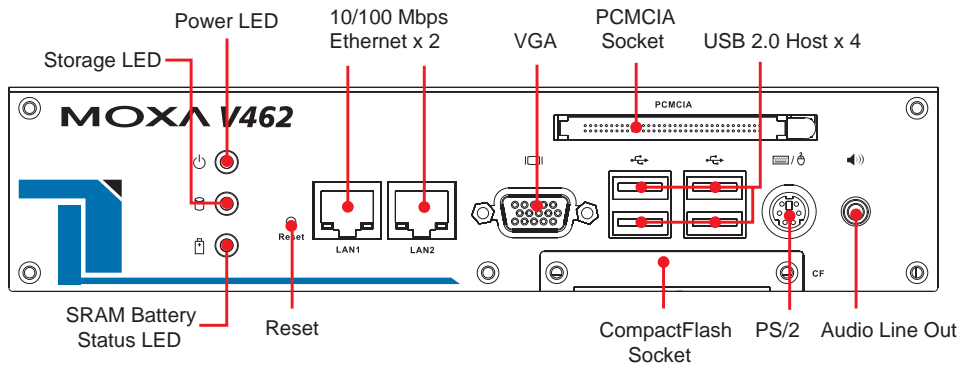
Appearance

Top View

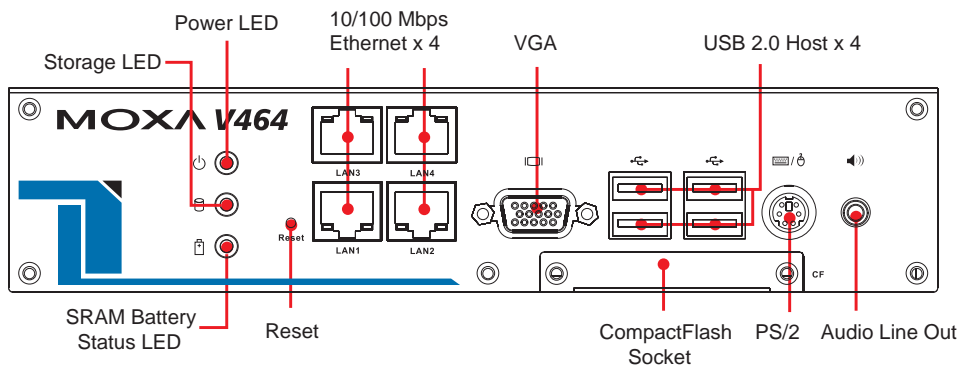


Front View

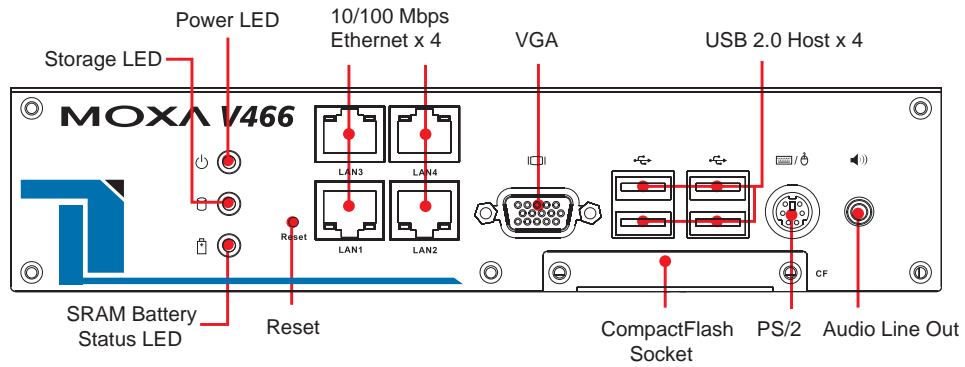
V462



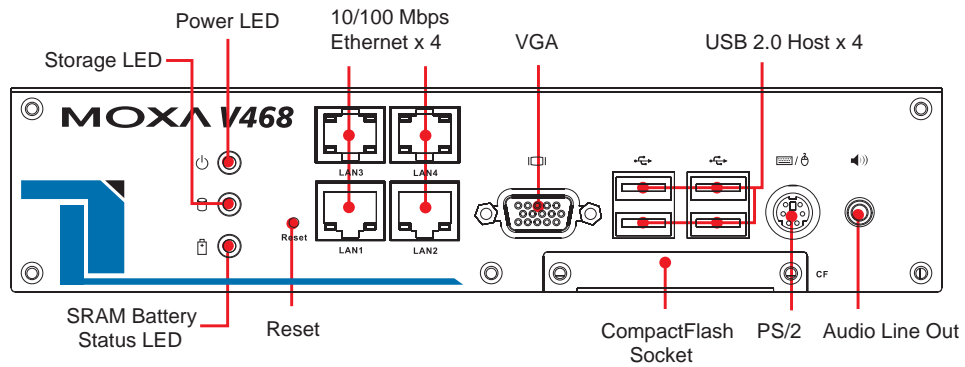
V464



V466

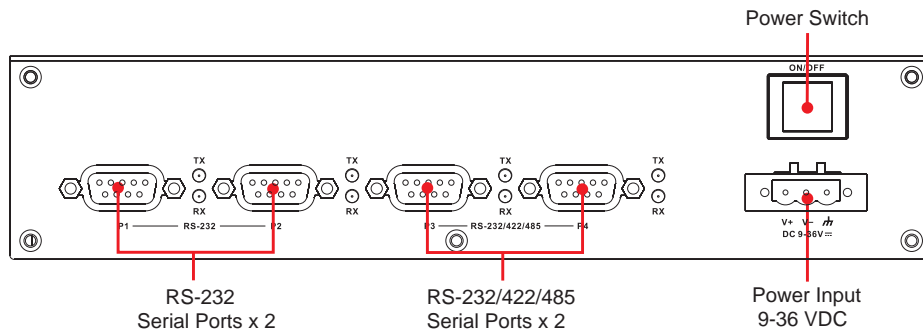


V468

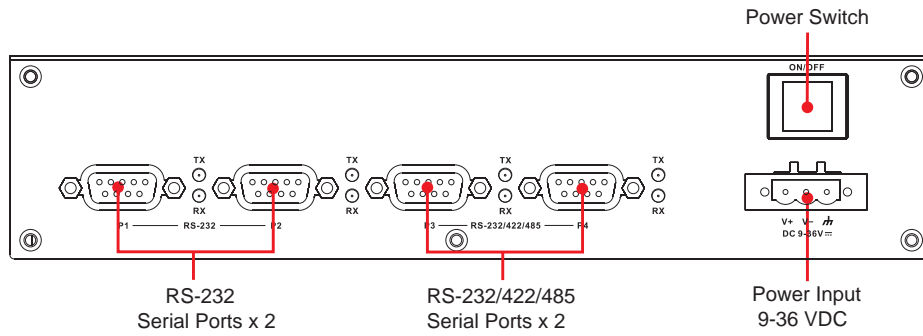


Rear View

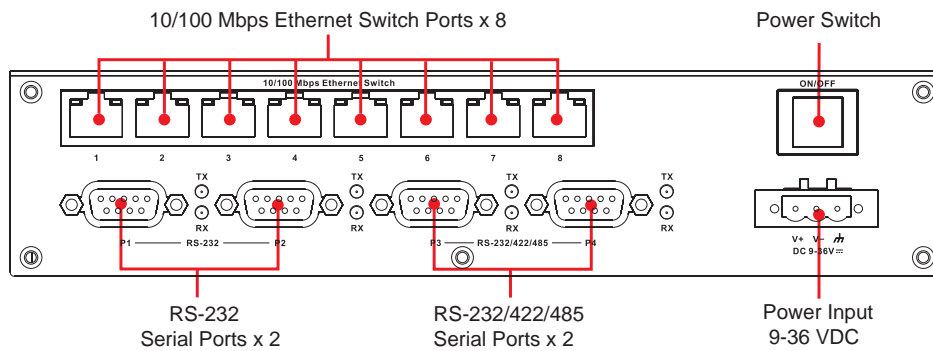
V462



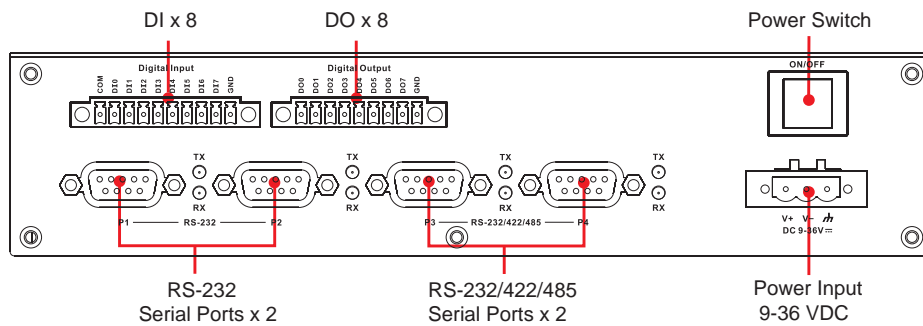
V464



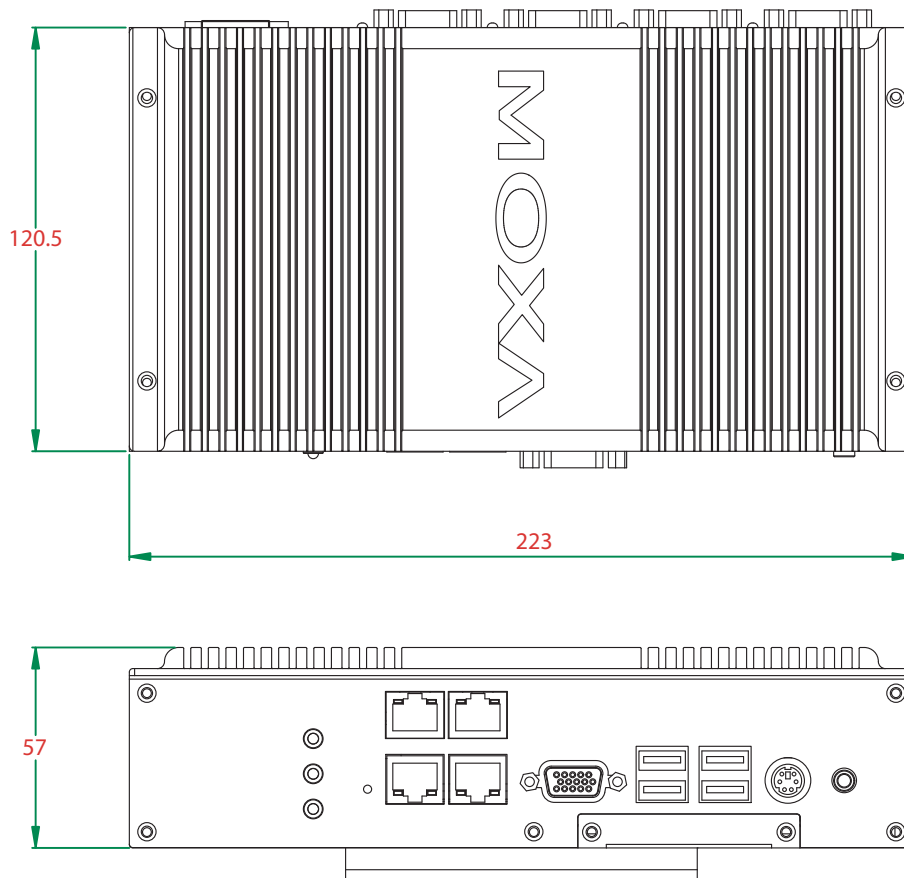
V466



V468



Dimensions (unit = mm)



LED Indicators

The LED indicators located on the front panel of the V460 series are listed in the following table.

LED Name	LED Color	LED Function
Power	Green	Power is on
	Off	No power input or any other power error exists
Battery	Red	Battery is dead or malfunctioning
	Off	Battery is operating normally
Storage	Yellow / Blinking	Storage device is active (data is being read or written)
	Off	Storage device is idle
LAN	Green	Lit when 10 Mbps Ethernet link is active (Off when inactive).
	Green	Lit when 100 Mbps Ethernet link is active (Off when inactive).
	Orange	Lit when data is transmitting.

Please note that the V462 has 2 RJ45 connectors, whereas the V464, V466, and V468 have 4 RJ45 connectors.

Power On/Off Button

The power on/off button is located above the power input terminal block. The button supports the ATX power on/off function. By default, the button is set for **instant off**. You may also configure the button for **delay 4 seconds** to guard against shutting down the power unintentionally. In this case, you must press the power button continuously for at least 4 seconds to shut off the power. For detailed configuration instructions, please see *Chapter 4: BIOS Setup* towards the end of this manual.

Reset Button

Press the Reset Button continuously for at least 5 seconds to load the factory default configuration. After the factory default configuration has been loaded, the system will reboot automatically. The Ready LED will blink on and off for the first 5 seconds, and then maintain a steady glow once the system has rebooted.

We recommend that you only use this function if the software is not working properly and you want to load factory default settings. The Reset to Default functionality is not designed to hard reboot the V460 Series.



ATTENTION

Reset to Default preserves user's data

The **Reset to Default** functionality will NOT format the user directory and erase the user's data. Pressing the Reset to default functionality will only load the configuration file. Other user data will not be deleted from the Flash ROM.

Real Time Clock

The V460's real time clock is powered by a lithium battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.



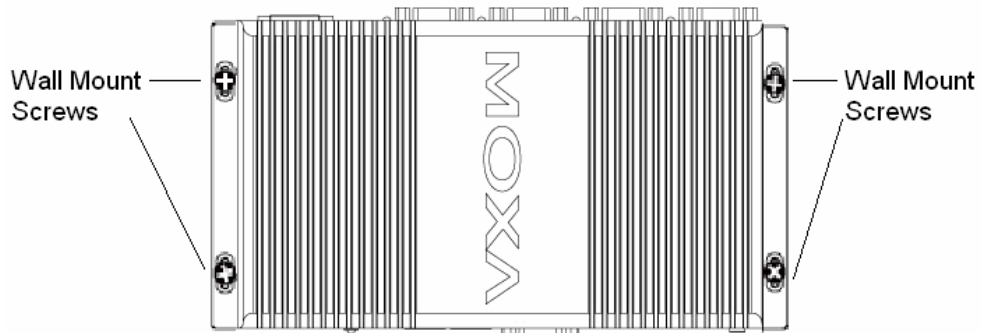
WARNING

There is a risk of explosion if the battery is replaced by an incorrect type.

Placement Options

Wall or Cabinet

The V460 computers have wall-mount ears for attaching to a wall or the inside of a cabinet. Use screws to attach the V460 to a wall or cabinet, as illustrated in the following figure.



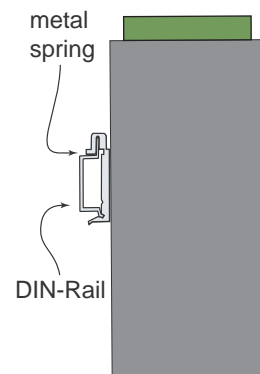
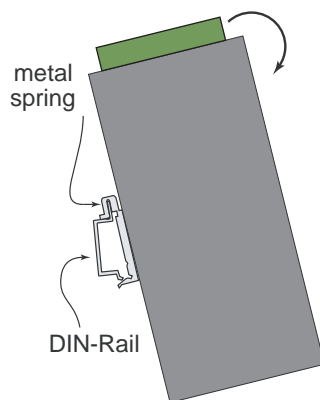
NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates.

DIN-Rail Mounting

An aluminum DIN-Rail Mounting Kit comes standard with the V460 series computers. The V460 can be mounted on a DIN-Rail either vertically or horizontally by changing the screw holes used for the stiff metal spring. If you need to reattach the DIN-Rail kit to the V460 series, make sure the stiff metal spring is situated towards the top, as shown in the following figures.

STEP1: Insert the top of the DIN-Rail into the slot just below the stiff metal spring.

STEP2: The DIN-Rail attachment unit will snap into place as shown.



To remove the V460 series from the DIN-Rail, simply reverse Steps 1 and 2.

Hardware Connection Description

The V460 series embedded computers are equipped with multiple connection types. VGA, RJ45 Ethernet connectors, serial ports, PCMCIA slot (V464), 8+8 DI/DO (V468) and unmanaged switching ports (V466) are built into the V460. The V460 also has a CompactFlash socket for storage expansion, USB ports for additional device and storage options, and an audio output port. The ready-to-run Windows Embedded operating system gives you the freedom to develop custom applications for any type of industrial automation application.

In this chapter, we describe how to connect the embedded computer to the network and to various devices. The following topics are covered:

- ❑ **Wiring Requirements**
 - Connecting the Power
 - Grounding the Unit
- ❑ **Connecting to a Display**
- ❑ **Connecting to a Keyboard and Mouse**
- ❑ **Connecting to the Network**
- ❑ **Connecting to a Serial Device**
- ❑ **Connecting to the unmanaged switch ports (V466 only)**
- ❑ **PCMCIA (V462 only)**
- ❑ **Connecting to the DI/DO (V468 only)**
 - Digital Input Wiring
 - Digital Output Wiring
- ❑ **Installing a Memory Module**
- ❑ **Inserting a CompactFlash Card**
- ❑ **USB Hosts**
- ❑ **Audio Interface**

Wiring Requirements

In this section, we describe how to connect various devices to the embedded computer. You should heed the following common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE: Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.



ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring.

Electrical Current Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

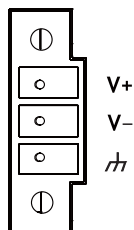
Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

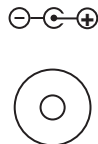
Connect the **live-wire** end of the 9-36 VDC power adaptor to the embedded computer's terminal block, and then connect the power jack to a power source. When the power is properly supplied, the **Power LED** will glow a solid green color.

Terminal Block



V+
V-
⌚

Power Jack





ATTENTION

The power for this product is intended to be supplied by a Listed Power Supply Unit, and rated to deliver 9 to 36 VDC at a minimum of 4A for 9 VDC, 1A for 36 VDC.

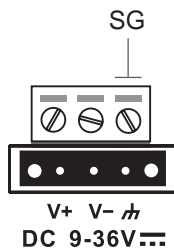
Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.



ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.



SG: The *Shielded Ground* (sometimes called *Protected Ground*) contact is the right most contact of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.

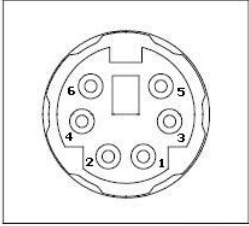
Connecting to a Display

The V460 series comes with a D-Sub 15-pin female connector to connect a VGA CRT monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the V460 series. The pin assignments of the VGA connector are shown below.

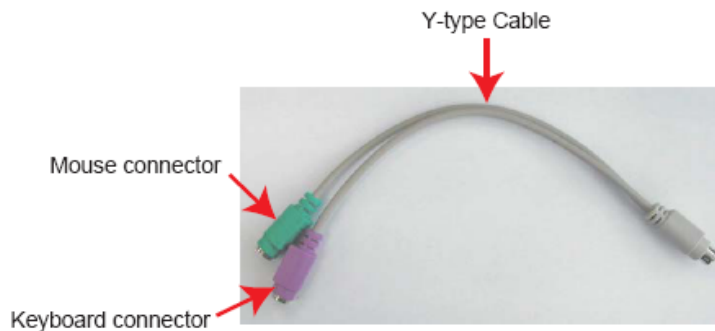
DB15 Female Connector	Pin No.	Signal Definition
	1	Red
	2	Green
	3	Blue
	4	NC
	5	GND
	6	GND
	7	GND
	8	GND
	9	VCC
	10	GND
	11	NC
	12	DDC2B Data
	13	HSYNC
	14	VSYNC
	15	DDC2B Clock

Connecting to a Keyboard and Mouse

The V460 series comes with a PS/2 connector to connect a PS/2 keyboard or PS/2 mouse by using a Y-type cable. This 6-pin mini-DIN connector has the pin assignments shown below.

PS/2 connector	Pin No.	Signal Definition
	1	Keyboard Data
	2	Mouse Clock
	3	GND
	4	VCC
	5	Keyboard Clock
	6	Mouse Data

Use the Y-type cable to convert the mini-DIN connector into two 6-pin mini-DIN connectors to connect both a PS/2 keyboard and PS/2 mouse at the same time.



ATTENTION

Please note that without the Y-type cable, the PS/2 connector on the V460 series can only work with a PS/2 keyboard. A PS/2 mouse will not function when directly connected to the PS/2 connector on the V460 series.

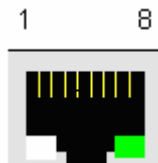
Connecting to the Network

Plug your network cable into the embedded computer's Ethernet port, and plug the other end of the network cable into your Ethernet network port. When the cable is properly connected, the LEDs on the embedded computer's Ethernet port will glow to indicate a proper connection.

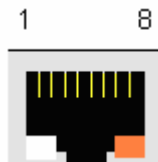
The V460 computers have 2 types of RJ45 connectors, depending on the location of the LED:

Type A.

This kind of connector are used for LAN 1 and LAN 2.



The LED indicator in the lower right corner glows a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

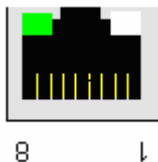


The LED indicator in the lower left corner glows a solid orange color when the cable is properly connected to a 10 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	Signal
1	ETx+
2	ETx-
3	ERx+
4	---
5	---
6	ERx-
7	---
8	---

Type B

This kind of connector is used for LAN 3, LAN4 (V464, V466, and V468), and switch ports 1 to 8 (V466 only).



The LED indicator in the lower right corner glows a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

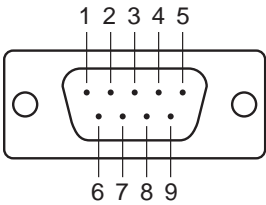


The LED indicator in the lower left corner glows a solid orange color when the cable is properly connected to a 10 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	Signal
1	ETx+
2	ETx-
3	ERx+
4	---
5	---
6	ERx-
7	---
8	---

Connecting to a Serial Device

Use serial cables to connect your serial devices to the embedded computer's serial ports. Serial ports P1 to P4 use DB9 male connectors and can be configured for RS-232 (COM1 to COM4), RS-422, or RS-485 (COM3 and COM4 only) communication by software. The pin assignments are shown in the following table:

DB9 Male Port		RS-232/422/485 Pinouts				
		Pin	RS-232	RS-422	RS-485 (4-wire)	RS-485 (2-wire)
		1	DCD	TxDA(-)	TxDA(-)	---
		2	RxD	TxDB(+)	TxDB(+)	---
		3	TxD	RxDB(+)	RxDB(+)	DataB(+)
		4	DTR	RxDA(-)	RxDA(-)	DataA(-)
		5	GND	GND	GND	GND
		6	DSR	---	---	---
		7	RTS	---	---	---
		8	CTS	---	---	---

Connecting to the unmanaged switch ports (V466 only)

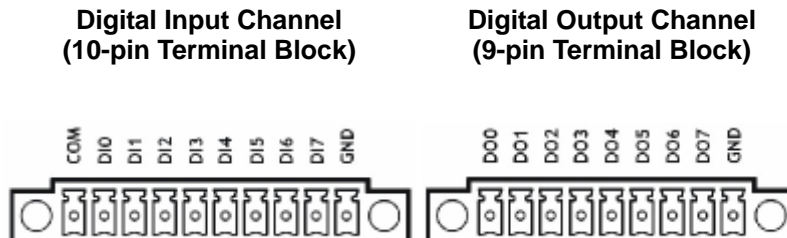
The V466 has 8 10/100Mbps unmanaged switch ports that enable fast data exchange between devices connected to the V466 and also upstream traffic to Internet. The pin assignments and LED indicator descriptions are described in the "Connecting to the network" paragraph above.

PCMCIA (V462 only)

The PCMCIA slot supports the CardBus (Card-32) Card standard and 16-bit (PCMCIA 2.1/JEIDA 4.2) Card standard. It supports +3.3V, +5V, and +12V at a working voltage of 120 mA. Wireless LAN card expansion is optional. The wireless LAN card suggested by Moxa lets you connect the V462 to a wireless LAN, with both 802.1b and 802.11g interfaces supported. If you need device drivers for other kinds of PCMCIA cards, contact Moxa for information on how to initiate a cooperative development project.

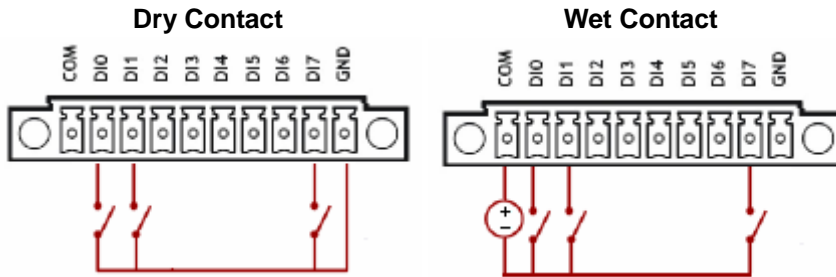
Connecting to the DI/DO (V468 only)

The V468 has an 8-ch digital input and 8-ch digital output, both of which support 3 KV optical isolation protection. The digital input channels and digital output channels are located on the rear side of the unit and output by terminal block. The pinouts for the I/O are shown in the following figure.



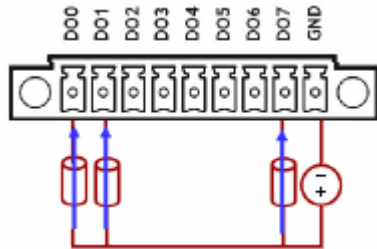
Wiring information is given below.

Digital Input Wiring



Note: If you are using wet contacts, you must connect **COM** to power.

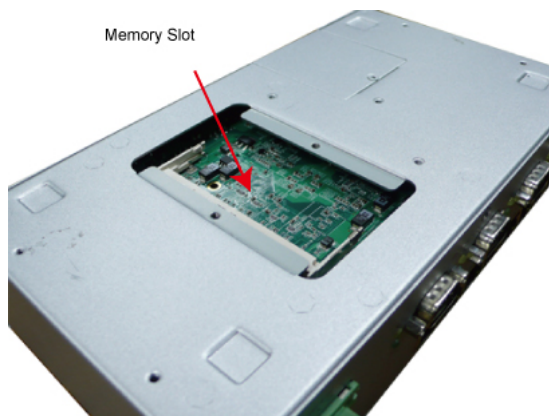
Digital Output Wiring



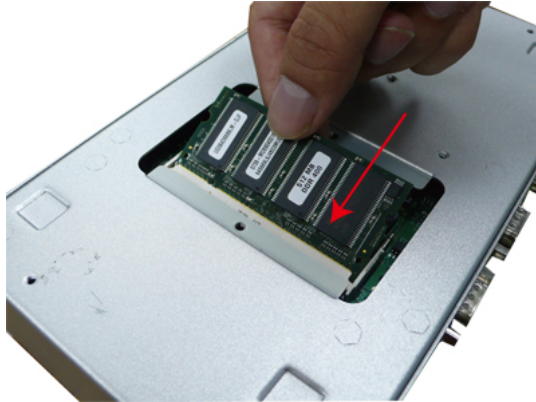
Installing a Memory Module

The V460 series has one 200-pin SO-DIMM socket for installing the DDR SDRAM memory module. One 256 MB DDR SDRAM module is already installed in the CE version and a 512 MB module is installed in the XPE version. To install an additional DDR SDRAM memory modules (from 128 MB to 1 GB), follow these instructions:

1. Disconnect the V460 series from the power source.
2. Unscrew the V460's bottom cover and then remove it.



3. Plug a DDR SDRAM module into the 200-pin SO-DIMM socket; be sure to situate the module correctly.

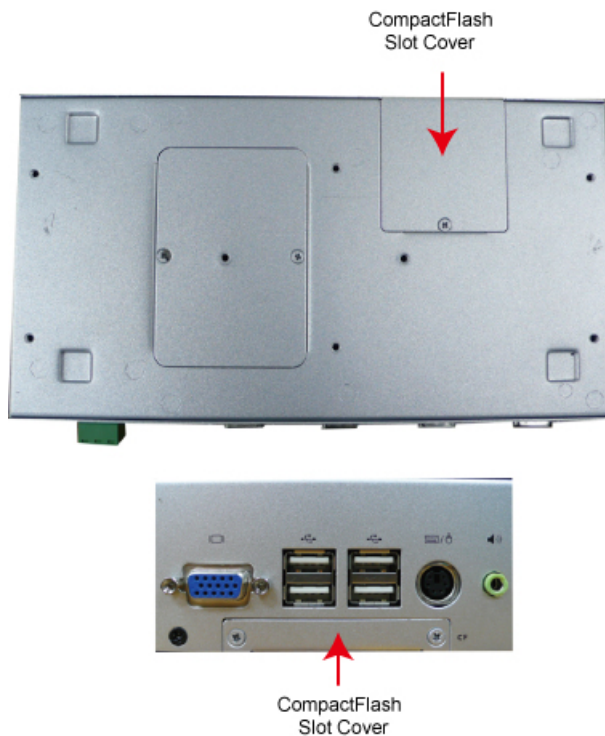


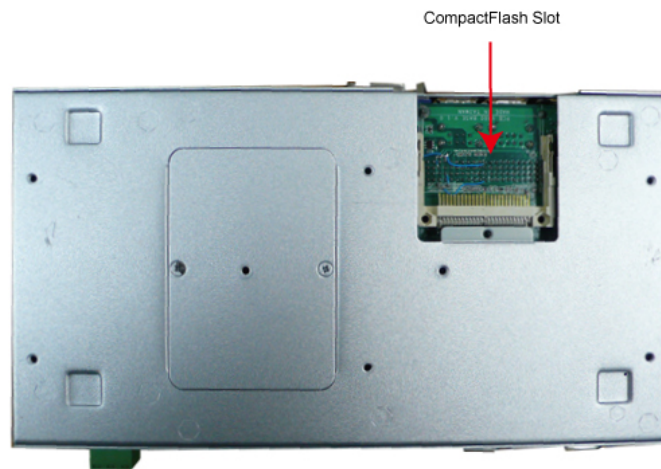
4. Replace V460's bottom cover.

Inserting a CompactFlash Card

The V460 comes with an industrial CompactFlash card pre-installed for storing the Windows Embedded operating system. A second CompactFlash socket is located inside the V460 to make it easy for users to add more memory. The additional slot allows users to add memory by inserting a CompactFlash memory card, without risking damage to the operating system. To insert a CompactFlash card, please follow these instructions.

1. Disconnect the V460 computer from the power source.
2. Unscrew the V460 computer's CompactFlash card cover on front panel and then remove it to reveal the expansion slot.





3. Plug a CompactFlash card into the socket; be sure to situate the module correctly.



4. Replace the V460's CompactFlash cover.

**ATTENTION**

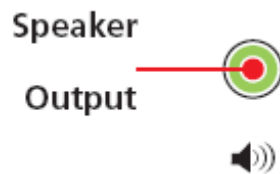
The V460 does not support CompactFlash hot swap and PnP (Plug and Play) function. You must remove power source first before inserting or removing the CompactFlash card.

USB Hosts

The V460 has two USB 2.0 ports. Both ports are UHCI, Rev. 2.0 compliant and support Plug & Play and hot swapping. The ports can be used to connect USB devices, such as a keyboard, mouse, USB flash disk, and USB CD-ROM. In addition, all USB ports support system boot up, which can be activated by modifying the BIOS settings. The next chapter describes the configuration process in detail.

Audio Interface

The V460 has a speaker interface that follows the AC97 standard enabling voice output.



In this chapter, we explain how to configure the V460 series' BIOS settings. The built-in BIOS setup program allows users to configure basic settings for the entire computer system. All of the configurations are stored in the CMOS RAM, which is connected a battery back-up. This means that the configuration settings will be stored in the CMOS RAM even if the computer is powered down.

The following topics are covered as below:

- Entering the BIOS Setup Utility**
- Modifying the BIOS Main Settings**
 - Basic Configuration
 - System Security
- Advanced Settings**
 - Removable Device/Hard Disk/Cd-ROM Boot Priority
 - First / Second / Third Boot Device
 - Boot Other Device
 - Modifying Advanced BIOS Settings
 - Advanced Chipset Settings
 - PnP/PCI Configurations
- Peripherals**
- Power**
- Hardware Monitor**
- Load Defaults**
- Exiting the BIOS Setup**
- Upgrading the BIOS**

Entering the BIOS Setup Utility

To enter the BIOS setup utility, please press the **Del** key after booting up the system. The main BIOS Setup Utility screen will appear.

A basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to scroll about the screen, how to select by pressing "Enter" and how to use the other hot keys listed below.

F1: General Help

F5: Previous Value

F6: Default Settings

F7: Turbo Settings

F10: Save

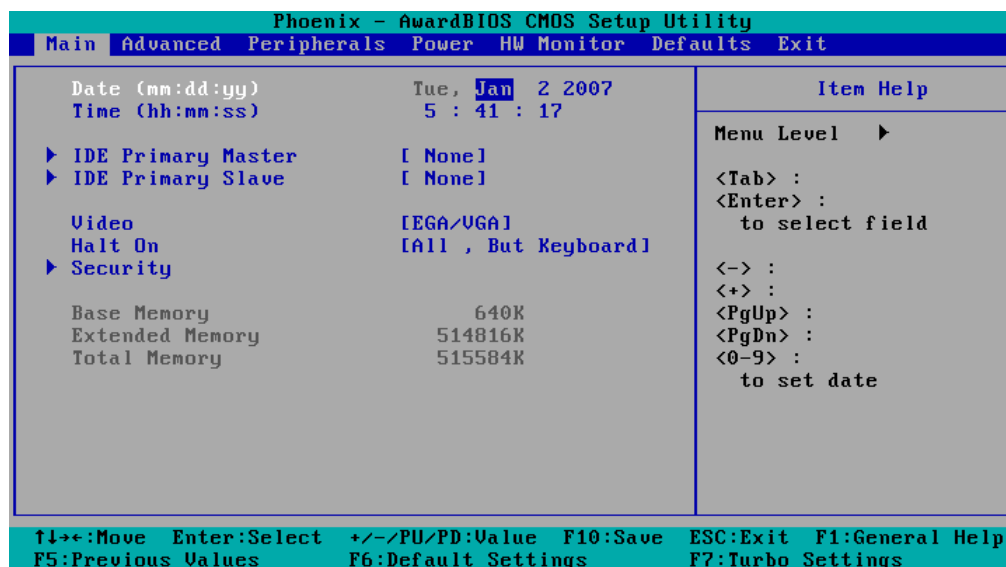
ESC: Exit

In the next section, we introduce the details of the BIOS configuration.

Modifying the BIOS Main Settings

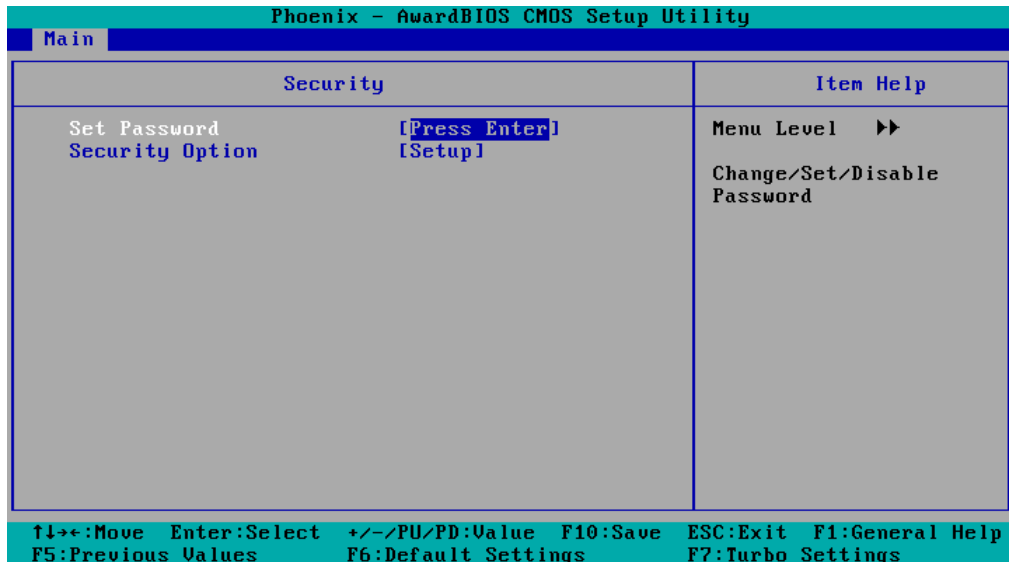
Basic Configuration

After entering the BIOS Setup Utility, or after choosing the **Main** option, the BIOS main menu will be displayed. Use this menu to check the basic system information, such as the memory and IDE hard drive. In addition, you can take care of basic system configuration, such as setting the date, time, hard drive settings, display type, halt on conditions, and system security settings.



System Security

To set up system security, select the **Security** option under **Main** to bring up the following screen.



The menu includes two options: **Set Password** and **Security Option**.

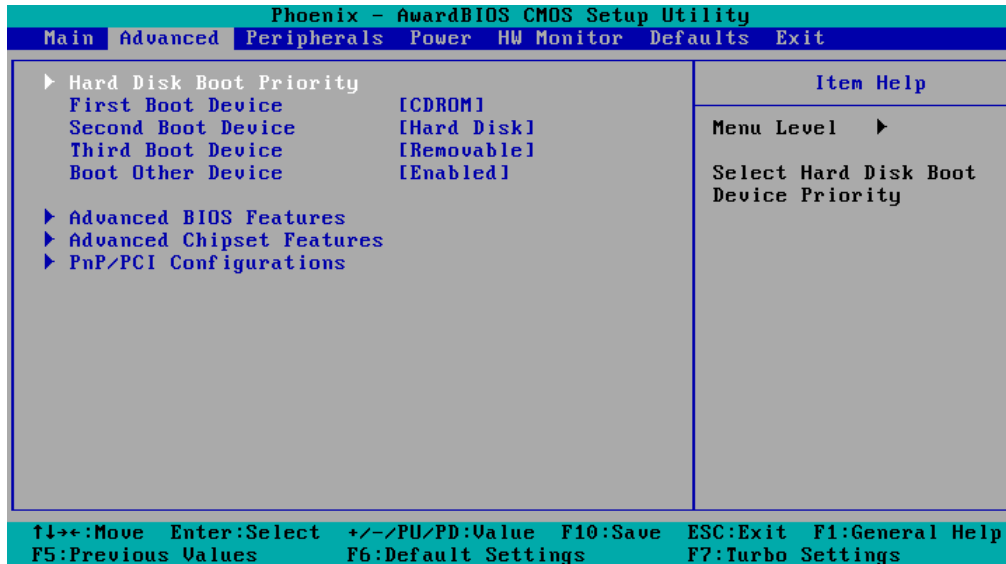
When you select the Set Password option, A pop-up **Enter Password** will appear on the screen. The password that you type will replace the password stored in the CMOS memory. You will be required to confirm the new password. Just re-type the password and then press <Enter>. You may also press <Enter> to abort the selection and not enter a password.

To clear an existing password, just press <Enter> when you are prompted to enter the password. A message will show up confirming that the password will be disabled. Once the password is disabled, the system will boot and you can enter the **BIOS Setup Menu** without entering a password.

Once a password has been set, you will be prompted to enter the password each time you enter Setup. This prevents unauthorized persons from changing any part of your system configuration. In addition, when a password setting is enabled, you can set up the BIOS to request a password each time the system is booted up. This prevents the unauthorized use of your computer. The **Security Option** setting determines when a password prompt is required. If the **Security Option** is set to **System** the password must be entered both at boot up and when entering the BIOS Setup Menu. If the password is set for **Setup** the password prompt only occurs when you enter the **BIOS Setup Menu**.

Advanced Settings

The **Advanced Features** screen will appear when you choose **Advanced** from the main menu.



Removable Device/Hard Disk/Cd-ROM Boot Priority

Select removable device/hard disk/cd-rom boot priority (dynamic).

First / Second / Third Boot Device

This option allows users to select or change the device boot priority. You may set 3 levels of priority to determine the boot up sequence for different bootable devices, such as a hard drive, CD-ROM, and removable devices. Select the order in which devices will be searched in order to find a boot device. The available options are **Removable (default for first boot device)**, **Hard Disk (default for third boot device)**, **CDROM (default for second boot device)**, and **Disabled**.

Boot Other Device

This setting allows the system to try to boot from other devices if the system fails to boot from the 1st, 2nd, or 3rd boot devices. The options are **Enabled (default)** and **Disabled**.

Modifying Advanced BIOS Settings

When you select the **Advanced BIOS Features** option under the **Advanced** menu, the **Advanced** configuration menu will appear.

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
Advanced		
Advanced BIOS Features		
Virus Warning	[Disabled]	Menu Level ▶ Allows 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
CPU Internal Cache	[Enabled]	
Boot Up NumLock Status	[On]	
Typematic Rate Setting	[Disabled]	
x Typematic Rate (Chars/Sec)	6	
x Typematic Delay (Msec)	250	
OS Select For DRAM > 64MB	[Non-OS2]	
Small Logo(EPA) Show	[Disabled]	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Default Settings F7:Turbo Settings		

Virus Warning

This item allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will display a warning message on the screen and sound an audio alarm (beep).

Options: Disabled (default), Enabled

CPU Internal Cache

Make CPU internal cache active or inactive. System performance may degrade if you disable this item.

Options: **Enabled (default)**, **Disable**.

Boot Up NumLock Status

Selects the power on state for NumLock.

Options: **On (default)**, Numpad keys are number keys, **Off**, Numpad keys are arrow keys.

Typematic Rate Setting

When **Enabled** the **typematic rate** and **typematic delay** can be configured. Typematic Rate determines the keystroke repeat rate used by the keyboard controller.

Options: **Disabled (default)**, **Enabled**.

Typematic Rate (Chars/Sec)

The rate at which a character repeats when you hold down a key.

Typematic Delay (Msec)

The delay before keystrokes begin to repeat.

Options: 250 (default), 500, 750, 1000.

OS Select For DRAM > 64MB

Select OS2 only if you are running the OS/2 operating system with greater than 64 MB of RAM.

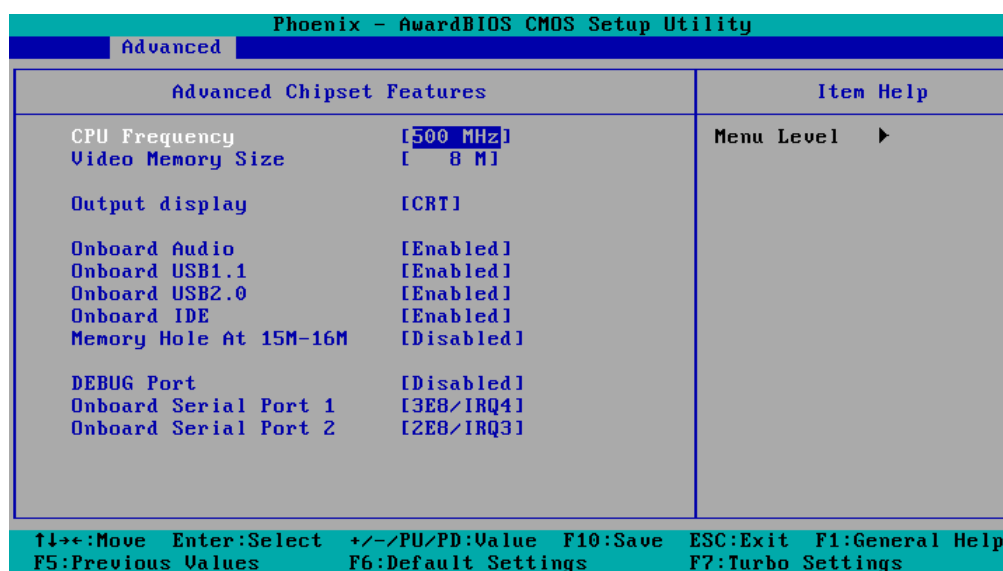
Options: Non-OS2 (default), OS2.

Small LOGO (EPA) Show

This item allows you to show or hide the small LOGO EPA.

Options: Disabled (default), Enabled.

Advanced Chipset Settings



CPU Frequency

This item allows you to select CPU frequency.

Options: Auto, 400 MHz, 500 MHz (default).

Video Memory Size

This item allows you to select video memory size.

Options: disable, 8 M(default), 16 M, 32 M, 64 M, 128 M, 254 M.

Output display

This item allows you to select output display.

Options: CRT.

Onboard Audio

This item allows you to enable the onboard audio function.

Options: **Enabled (default), Disabled.**

Onboard USB1.1

This item allows you to enable the onboard USB 1.1 function.

Options: **Enabled (default), Disabled.**

Onboard USB2.0

This item allows you to enable the onboard USB 2.0 function.

Options: **Enabled (default), Disabled.**

Onboard IDE

This item allows you to enable the onboard IDE function.

Options: **Enabled (default), Disabled.**

Memory Hole at 15M-16M

When enabled, you can reserve an area of system memory for ISA adaptor ROM. When this area is reserved, it cannot be cached. Refer to the user documentation of the peripheral you are installing for more information.

Options: **Disabled (default), Enabled.**

Debug Port

Select an address and corresponding interrupt for serial port.

Options: **Disabled (default), 3F8/IRQ4.**

Onboard Serial Port 1

Select an address and corresponding interrupt for serial port.

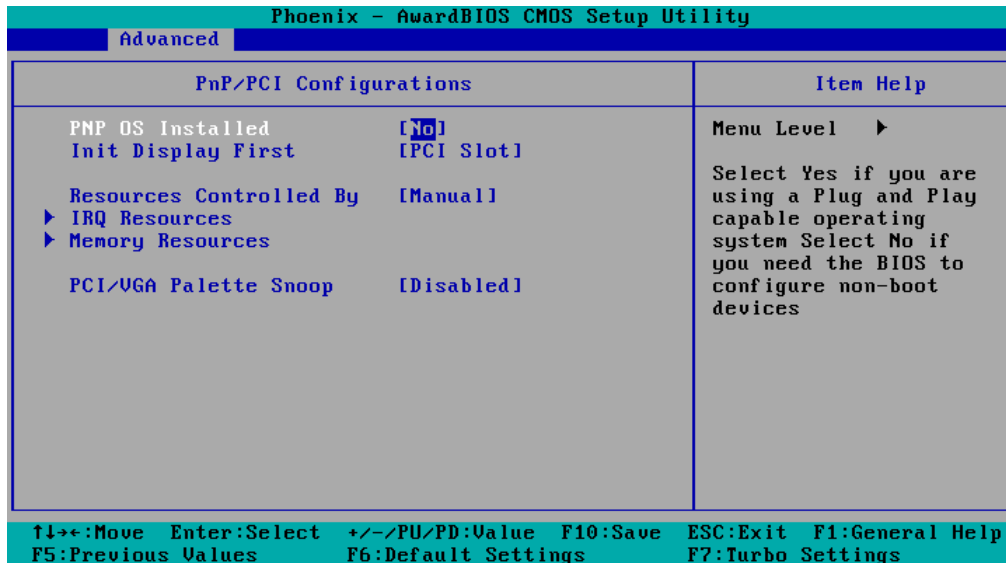
Options: **Disabled, 3E8/IRQ4 (default).**

Onboard Serial Port 2

Select an address and corresponding interrupt for serial port.

Options: **Disabled, 2E8/IRQ3 (default).**

PnP/PCI Configurations



PNP OS Installed

Default value is **No**. When you install an operating system that supports Plug-and-Play (Windows 2000 or XP, for example), choose **Yes**.

Init Display First

This item allows you to activate display equipment from an onboard graphics unit or 3rd party graphics card. The default setting is **PCI Slot**.

Memory Resources

This item is used to reserve legacy memory resources C800 to DFFF.

Resources Controlled By

When the default setting **Auto (ESCD)** is selected, the system BIOS will automatically assign the IRQ, DMA, and base address resources for all compatible PnP / PCI devices when the system boots up. If the automatic assignments cause conflicts between different devices, then change the setting to **Manual** and assign the IRQ, DMA, and memory base address manually.

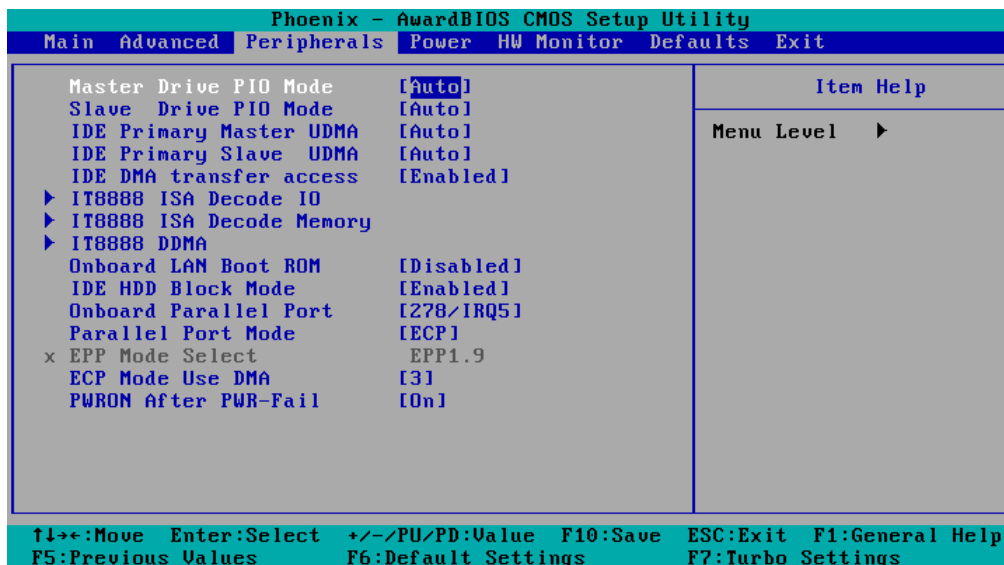
IRQ Resources

Set **Resources Controlled By** to **Manual** to assign IRQ resources manually. Options include **IRQ-5 Reserved** and **IRQ- 10/ 11 assigned to PCI device**. When configuring this setting, be careful to avoid IRQ conflicts.

PCI / VGA Palette Snoop

Some graphics controllers that are not VGA compatible take the output from a VGA controller and map it to their display as a way to provide boot information and VGA compatibility. For an integrated graphics controller chipset, the default is **Disabled**.

Peripherals



IDE Primary Master/Slave PIO

Each IDE interface can connect to 2 IDE devices, with one device called **master** and the other device called **slave**. The IDE PIO (Programmed Input / Output) lets you set a PIO mode (0-4) for each of the IDE devices that the onboard IDE interface supports. Modes 0 to 4 will increase performance incrementally. The Auto mode will allow the system to determine the best mode for each IDE device automatically. This is the default setting.

IDE Primary Master/Slave UDMA

This system supports Ultra DMA 100 functionality, and the operating environment requires a DMA driver if you are using Windows 95 OSR2 or a third party IDE bus master device. If both the IDE device and system software support Ultra DMA 100, select **Auto** to enable the BIOS support. The default setting is **Auto**.

IDE DMA Transfer Access

This feature allows you to enable or disable DMA (Direct Memory Access) support for all IDE devices. If you disable this BIOS feature, the BIOS will disable DMA transfers for all IDE drives and use PIO mode transfers. If you enable this BIOS feature, the BIOS will enable DMA transfers for all IDE drives. The proper DMA mode will be detected at boot-up. If the drive does not support DMA transfers, then it will use PIO mode instead. The default setting is **Enable**.

IT8888 ISA Decode IO

This feature allows you to decode IO resource to ISA bus for special devices used.

IT8888 ISA Decode Memory

This feature allows you to decode memory resource to ISA bus for special devices used

IT8888 DDMA

This feature allows you to control Distributed DMA channel 0, 1 function.

Onboard LAN Boot ROM

Decide whether or not to invoke the boot ROM of the onboard LAN chip. Default is disabled.

IDE HDD Block Mode

Block mode is also known as block transfer, multiple commands, or multiple sector read/write. Select the "Enabled" option if your IDE hard drive supports block mode (most new drives do). The system will automatically determine the optimal number of blocks to read and write per sector.

Options: **Enabled (default), Disabled.**

Onboard Parallel Port

Select a matching address and interrupt for physical parallel (printer) port.

Options: **Disabled, 278/IRQ5 (default).**

Parallel Port Mode

Select an operating mode for the onboard parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP or ECP mode.

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

EPP Mode Select

Select EPP port type 1.7 or 1.9.

Options: **EPP1.9 (default), EPP1.7.**

ECP Mode Use DMA

Select a DMA channel for the port.

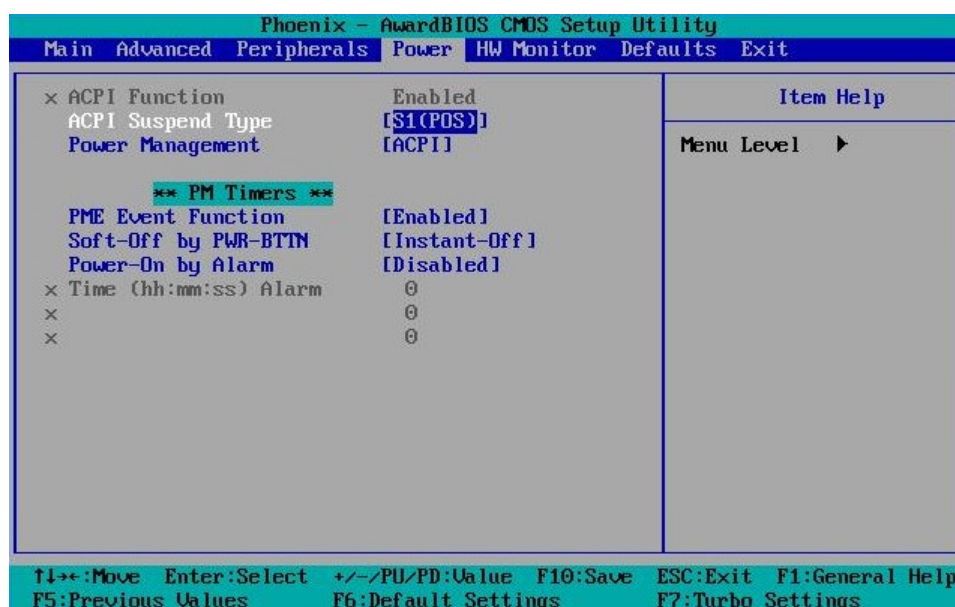
Options: **1, 3 (default).**

PWRON After PWR-Fail

Setting this parameter to **On** will cause the system to boot up immediately once the power is restored after a power failure, regardless of whether the system status is on or off. If set to **Former-Sts** the system will be restored to the status that existed before the power failure. The default setting is **On**.

Power

The **Power Setup** menu allows you to configure your system to utilize energy conservation features, as well as power-up/ power-down options.



ACPI Suspend Type

This item will set which ACPI suspend type that will be used.

Options: S1 (POS) (default), S3 (STR), S1&S3.

Power Management

This category allows you to select the type (or degree) of power saving.

Options: Disabled, ACPI (default).

PME Event Function

This option will also cause the system to wake up with any onboard LAN activity.

Options: Disabled, Enabled (default).

Soft-Off by PWRBTN

In situations where the system enters a **hung** state, you can configure the BIOS so that you are required to push the power button for more than 4 seconds before the system enters the Soft-Off state.

Options: Delay 4 Sec, Instant-Off (default).

Power-On by Alarm

When **Enabled**, you can set the date and time at which the RTC (real-time clock) alarm wakes the system from Suspend mode.

Options: Disabled (default), Enabled.

Time (hh: mm: ss) Alarm

You can choose the hour, minute and second the system will boot up. This field is only configurable when **Resume by Alarm** is set to **Enabled**.

Hardware Monitor

The **HW Monitor** page is shown as below. Refer to this page to view the system hardware status, and effect changes in real-time.

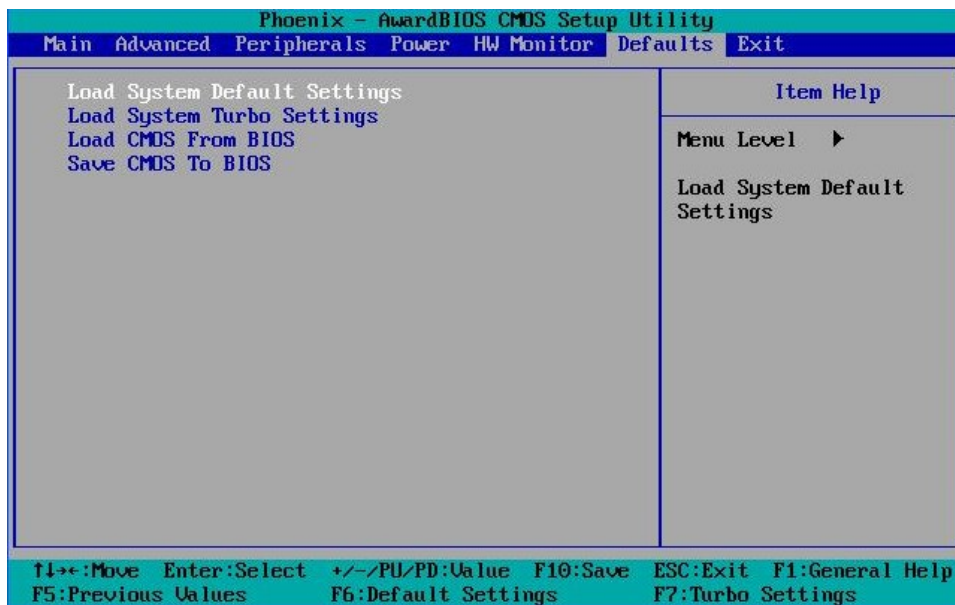
Phoenix - AwardBIOS CMOS Setup Utility						
Main	Advanced	Peripherals	Power	HW Monitor	Defaults	Exit
CPU Warning Temperature	[90°C/194°F]	Item Help				
System Temperature	38°C/100°F	Menu Level ▶				
CPU Temperature	52°C/125°F					
CPU FAN Speed (CPUFAN)	0 RPM					
VCORE(V)	1.24 V					
VMEM(V)	2.64 V					
+ 3.3 V	3.37 V					
+ 5 V	5.16 V					
+12 V	12.28 V					
VBAT(V)	3.02 V					
5USB(V)	4.92 V					
F1←+:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Default Settings F7:Turbo Settings						

CPU Warning Temperature

To prevent the system from reaching an overheated state, configure the CPU warning temperature. A typical value is between 90 and 100°C. When CPU temperature is over the setting temperature, system will beep.

Options: 90°C/194°F (default), 100°C/212°F, 110°C/230°F, 120°C/248°F, Disabled.

Load Defaults



Load System Default Settings

Use this option to load system factory default settings instead of the current BIOS settings. This option is useful for when the system is unstable. Users do not need to remember what settings were active before the system fails.

Load CMOS from BIOS

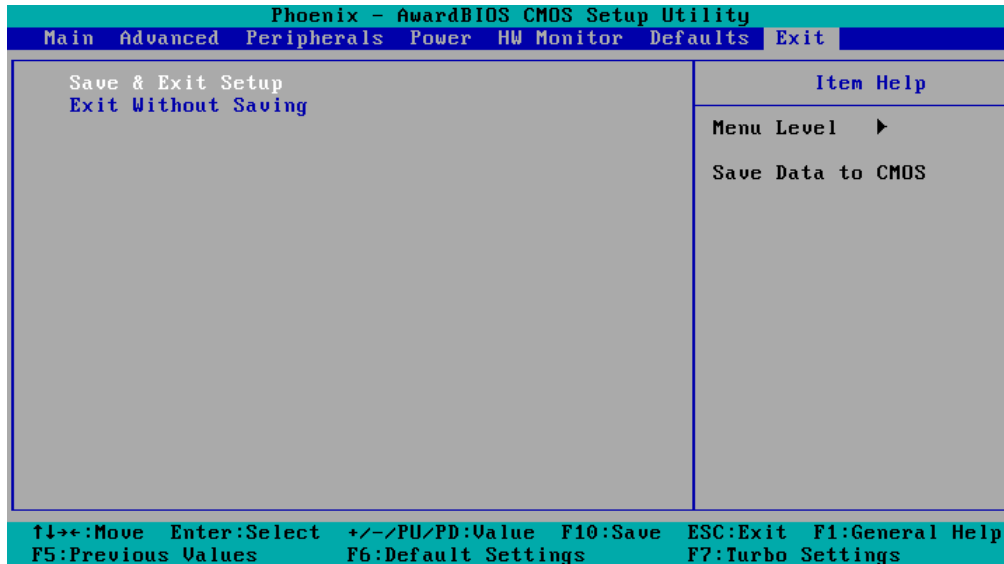
Use this option to load defaults from the flash ROM.

Save CMOS to BIOS

Use this option is to save CMOS defaults to the flash ROM.

Exiting the BIOS Setup

To exit the BIOS setup utility, choose **Exit**. Pressing <ESC> will achieve the same result.



Save & Exit Setup

Save all configuration changes to CMOS (memory) and exit setup. A confirmation message will be displayed before proceeding.

Exit Without Saving

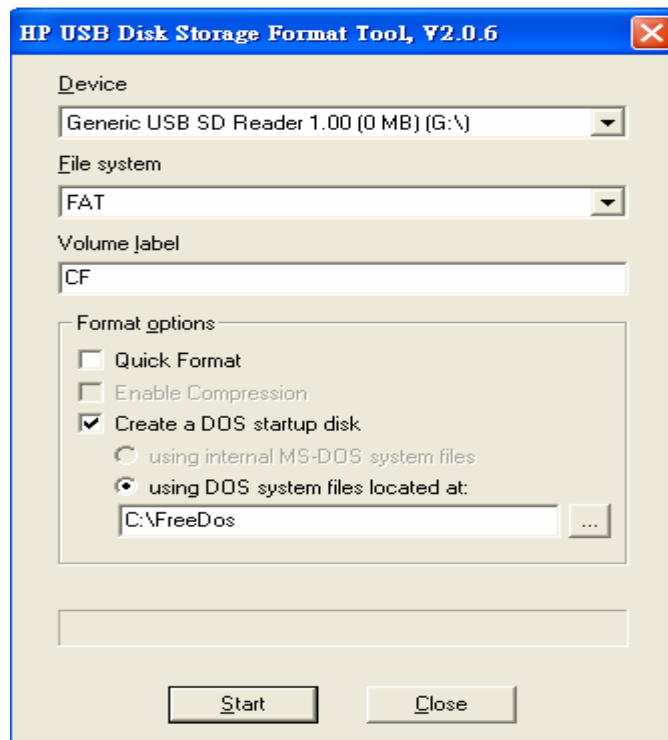
Abandon all changes made during the current session and exit setup. A confirmation message will be displayed before proceeding.

Upgrading the BIOS

1. Create a bootable USB disk:
 - Use **HP USB Disk Storage Format Tool** (can be searched to find resource address from google)
 - a. Copy **kernel.sys** and **command.com** to a specified directory.
 - b. Start the HP USB Disk Storage Format Tool.

NOTE: The HP USB Disk Storage Format Tool can be downloaded from HP's website. To find the tool, link to www.hp.com and use the website's search tool with keyword "HP USB Disk Storage Format Tool" to search and download the tool.
 - c. Select the USB device that you want to use as a bootable disk in the Device drop down box.
 - d. Select **FAT** in the File system drop down box.
 - e. Type the disk name in the Volume label field.
 - f. Check the option **Create a DOS startup disk** under format options.
 - g. Specify the directory for the **include** system files.

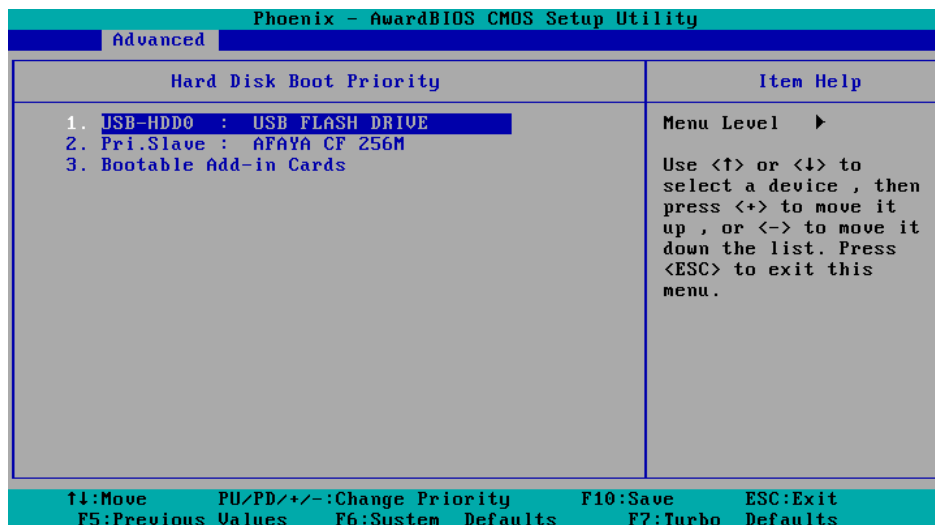
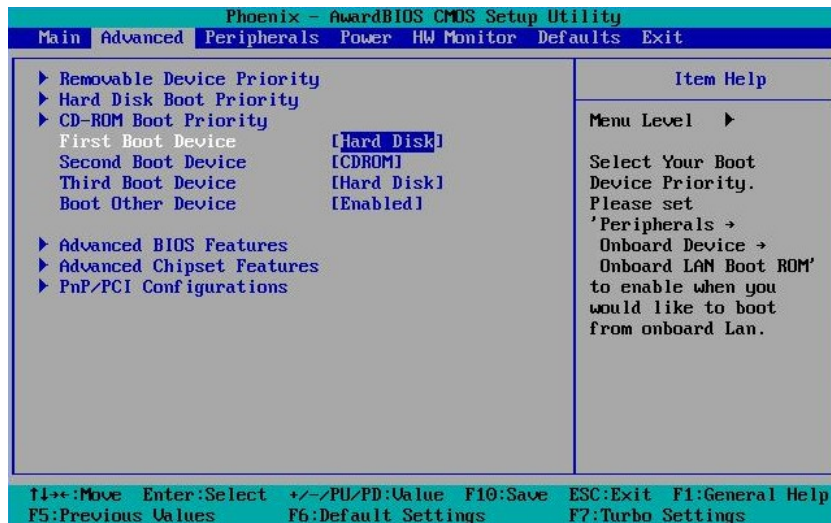
- h. Click **start** to format the USB disk.



- Use BootFlashDOS (can be download from <http://gocoding.com/page.php?al=bootflashdos>)
 - a. Click **Start**.



2. Bios setup for the V460 series.
 - a. Double click to extract the bios update tool file. In Windows, the file will have the form: BIOS_model name_version_Build_date.zip.
Model name, version, and date will change subject to different model and release date. For example, BIOS_V462_V1.0_Build_07080815.ZIP means the compress file is the BIOS update tool file for V462 built at 8th August, 2007 and version is V1.0.
 - b. Extract the compress file which includes 2 items: one binary file in form of XXX.bin, and upgrade utility names "awdf flash.exe". Save them into the USB disk.
 - c. Insert the USB disk.
 - d. Power on the V460 series computer and then press **DEL** to enter the bios setup menu.
 - e. Select **Advanced** → **Hard Disk Boot Priority** and then press **Enter**.
 - f. From the setup menu, use "↑" or "↓" to select the USB device.
 - g. Press "+" to move an item up to the first priority, and press **ESC** to exit the setup menu.
 - h. Make sure the first boot device is **Hard Disk**. If not, press **Enter** to change it.



- i. Select **Exit** → **Save & Exit Setup** and press **Enter**.
 - j. Choose **Y** to save to CMOS and then exit.
3. Run `awdflash.exe` to update the bios.
 - a. Boot from the USB disk in pure DOS mode.

```

CPU Type       : Geode GX-MMX      Base Memory    : 640K
Co-Processor   : Installed         Extended Memory : 514816K
CPU Clock      : 500MHz            Cache Memory   : 128K
-----
Pri. Master Disk: None             Display Type   : EGA/UGA
Pri. Slave Disk: LBA,ATA 33, 256MB Serial Port(s) : 3F8 3E8 2E8
                                           Parallel Port(s) : 278
                                           SDRAM at Rows   : 0 1
-----
PCI device listing ...
Bus No. Device No. Func No. Vendor/Device Class Device Class      IRQ
-----
0      1      1      1022 2081 0300 Display Cntrlr      11
0      1      2      1022 2082 1010 En/Decryption Cntrlr 11
0      15     2      1022 209A 0101 IDE Cntrlr        14
0      15     3      1022 2093 0401 Multimedia Device  11
0      15     4      1022 2094 0C03 USB 1.0/1.1 OHCI Cntrlr 10
0      15     5      1022 2095 0C03 USB 2.0 EHCI Cntrlr  10
1      5      0      10EC 8139 0200 Network Cntrlr     11
1      10     0      10EC 8139 0200 Network Cntrlr     10
                                           ACPI Controller    9
-----
Building DMI Pool ..... Success
Verifying DMI Pool Data ..... Update Success

```

- b. Run `awdflash /?` to see the help menu (P.1).

```

AWDFLASH v8.32L (03/24) (C)Phoenix Technologies Ltd. 2003 All Rights Reserved

Usage: AWDFLASH [FileName1] [FileName2] [/<sw>[/<sw>...]]
      FileName1 : New BIOS Name For Flash Programming
      FileName2 : BIOS File For Backing-up the Original BIOS
<Switches>    ?: Show Help Messages
py: Program Flash Memory          pn: No Flash Programming
sy: Backup Original BIOS To Disk File sn: No Original BIOS Backup
sb: Skip BootBlock programming    wb: Always Programming BootBlock
cd: Clear DMI Data After Programming cc: Clear CMOS Data After Programming
cp: Clear PnP(ESCD) Data After Programming
ld: Destroy CMOS Checksum And No System Halt For First Reboot
    After Programming             tiny: Occupy lesser memory
qi: Qualify flash part number with source file
e: Return to DOS After Programming R: RESET System After Programming
f: Use Flash Routines in Original BIOS For Flash Programming
cks: Show update Binfile checksum cksXXXX: Compare Binfile CheckSum with XXXX

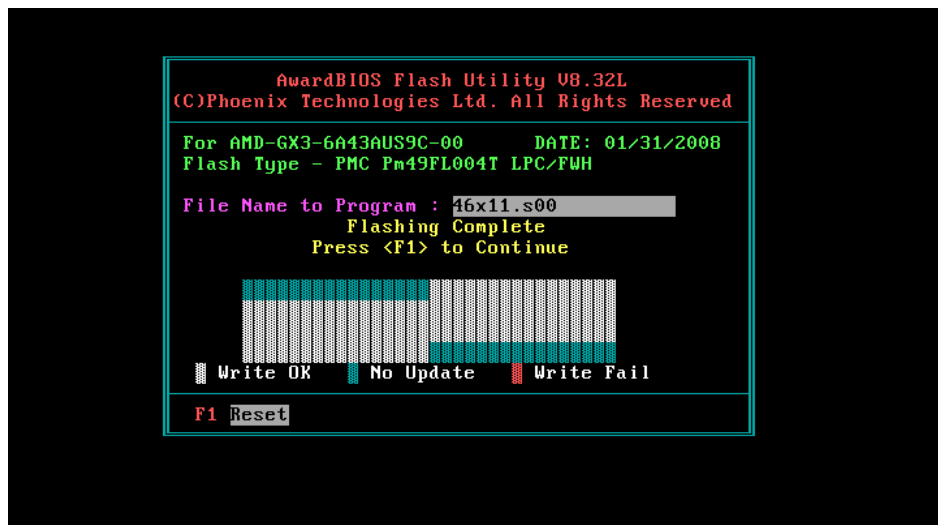
NUMAC:XXXXXXXXXXXXXXXXX          NUGUID:XXXXXXXXXXXXXXXXX
      Support nForce Input MAC,GUID Function,with "/wb" to update MAC and GUID.

Example: AWDFLASH 6A69R000.bin /py/sn/numac:xxxxxxxxxxxx/wb
C:\N46X>

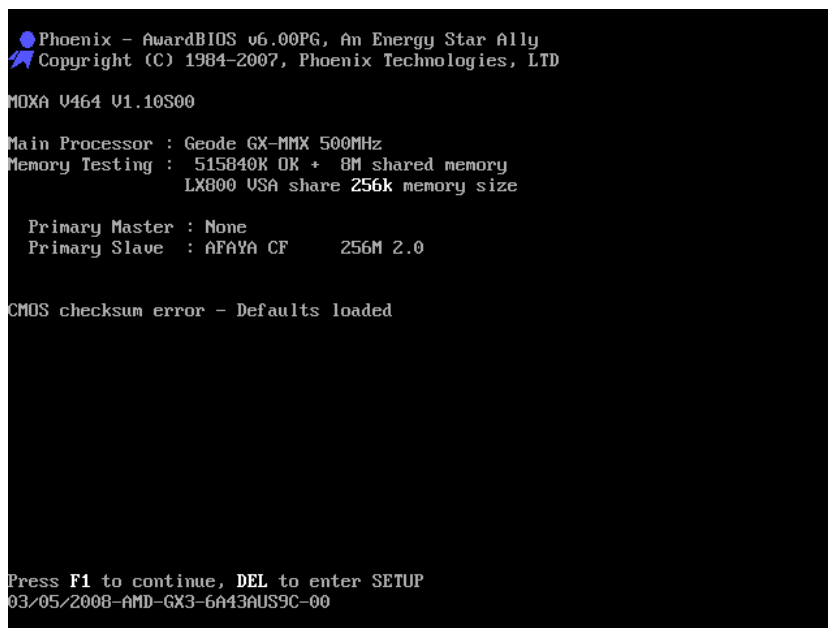
```

- c. Run `awdflash xxx.bin` from the command line to update the bios.

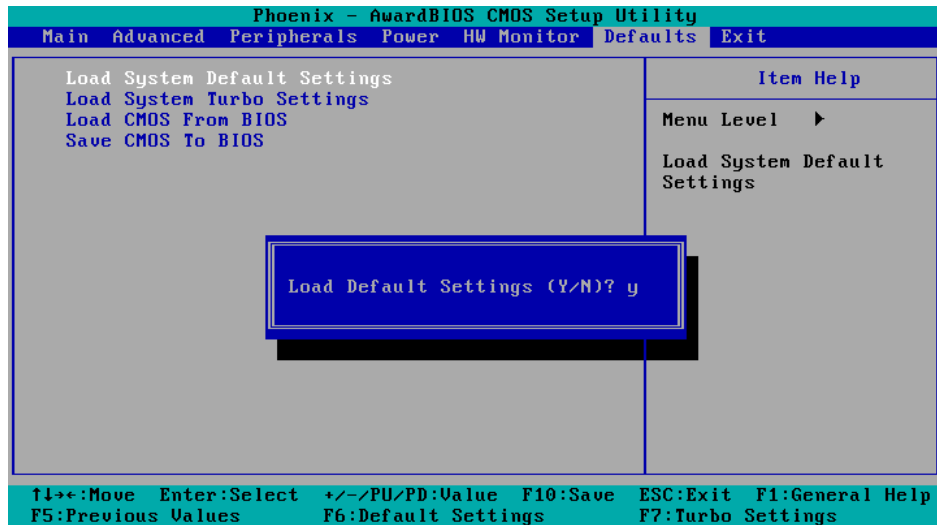
- d. Press the **F1** key to reset the system after the bios update is completed (P.2).



- e. Press the **“DEL”** key to enter the bios setup menu after resetting (P.3).



- f. Select **Defaults** → **Load System Default Settings** and then choose **Y** after pressing **Enter** (P.4).



- g. Select **Exit** → **Save & Exit Setup** and then press **Enter** to choose **Y** to save to CMOS and exit (P.5).

