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ROBO-8712E Series

Single Board Computer

User's Manual

P/N: B8980851 Version 1.1

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How to Use This Manual

The manual describes how to configure your ROBO-8712E series system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Board Computer.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single board computer.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get ROBO-8712E series running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

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EC Declaration of Conformity
(To Be Added)

For the following equipment:

Product Name:

Model Name:

Trade Name:

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC). The equipment was evaluated and passed the test, the following standards were applied :

EMC :	EN 55022	(1994/A1:1995 Class A)
	EN 50082-2	(1991)
	EN 61000-4-2	(1995)
	EN 61000-4-3	(1996)
	EN 61000-4-4	(1995)
	EN 61000-3-2	(1995)
	EN 61000-3-3	(1995)

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Place Date Legal Signature of Authorized Person

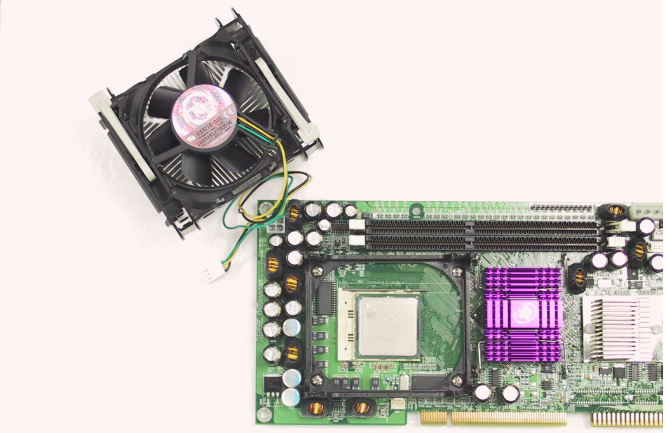
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WARNING

■ Remove Processor

Caution: Do not pull out processor without opening socket handle!

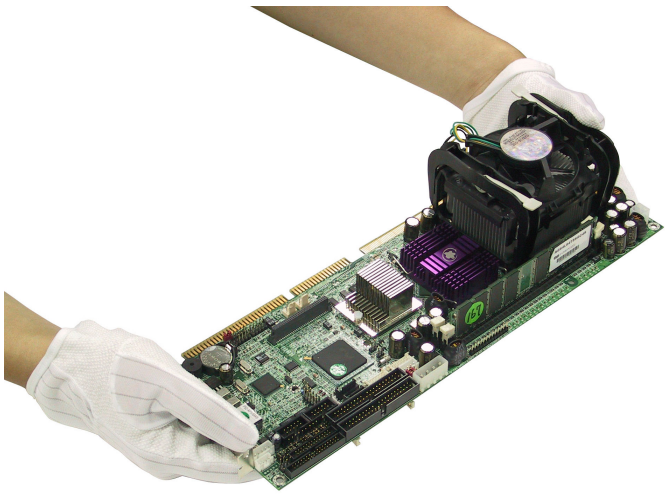
- High viscosity thermal grease between processor and cooler will lead the processor be pulled out from socket when taking cooler off.
- This action may damage processor socket, which will cause poor contact between CPU & socket.



■ Handling SBC

Caution: Do not just hold any single side of the SBC; hold evenly on both sides!

- Heavy processor cooler shall bend the SBC when SBC being held just on one side.
- The bending may cause serious soldering or circuit damage.



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Chapter 1
System Overview

1.1 Introduction

ROBO-8712E series, the enhanced model of ROBO-8712VLA supports both Northwood and Prescott core processor, and this allows users adopt the most economic processor based on their own application. More than that, ROBO-8712E series also supports Mobile Intel® Pentium® 4-M & Mobile Celeron processor. Maximum TDP (Thermal Design Power) of Mobile Intel® Pentium® 4-M processor is 35W (Processor frequency is 2.5GHz), it is about half thermal power generated by the same frequency P4 processor. Therefore, customer can enjoy the processor speed without worry about heat and heavy mass of big CPU cooler under critical environment.

Performance and port of Ethernet are upgraded also. The Fast Ethernet on ROBO-8712VLA is not enough for some applications, although it could expanded by Portwell's proprietary Omni PCI connector people prefer to have a board with more powerful and more ports on it directly for space saving. Echo to the request, ROBO-8712EVG2A provides two Gigabit Ethernet ports on bracket.

The ROBO-8712E series support six USB 2.0 ports; two on bracket for external keyboard and mouse; four internal for extension to front or rear side of system. USB allows user to add on other function to system without pain such as IRQ interference.

ROBO-8712E series features:

- Support 400/533/800*MHz front side bus Northwood, Prescott core Intel® Pentium® 4 & Celeron (D) processor and
- Support 400MHz front side bus low TDP Mobile Intel® Pentium® 4-M & Celeron processor
- Support DDR 266/333/400*, up to 2GB system memory and integrated Intel® Extreme Graphics with DVMT (Dynamic Video Memory Technology) that ensures the most efficient use of system memory
- Equipped dual or single Ethernet port on-board
- Audio in/out, Watch-dog timer, 6 USB 2.0 ports

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1.2 Check List

The ROBO-8712E series package should cover the following basic items:

- ✓ One ROBO-8712E series single board computer
- ✓ One serial port kit with two COM ports
- ✓ One IDE cable
- ✓ One Floppy cable
- ✓ One Parallel port cable kit
- ✓ One 4-pin ATX power control cable for backplane connection
- ✓ One Installation Resources CD-Title
- ✓ Retention of CPU cooler on SBC
- ✓ One booklet of ROBO-8712E series manual

Optional Accessories (not included in standard package)

- ✓ PS/2 keyboard and mouse cable with bracket
- ✓ Multimedia kit with MIC, Line In, Line Out and USB connectors

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

Main Features

- Intel 845GV based PICMG 1.0 SBC with VGA/LAN/Audio
- Support mPGA478 socket Pentium 4, Celeron (D), Mobile Pentium 4-M and Mobile Celeron processor
- Processor FSB speed 400/533/800* MHz
- Support DDR266/333/400* DDR SDRAM memory up to 2GB without ECC support
- Intel GMCH integrated graphic device with up to 64MB Dynamic display memory
- Support two a DMA/33/66/100 IDE
- Support Standard I/O including 2 serial ports, 1parallel port, one IrDA port, 6 USB ports (USB 2.0 compliant) and 8 high driving GPIO.
- Compliant with PCI Bus spec V2.1
- Full-size All-in-one SBC with PICMG 1.0 Rev 2.0 compliant

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System Specifications

- **Chipset**
  - Intel 845GV and ICH4
- **CPU**
  - Support one mPGA478 socket Pentium 4, Celeron (D), Mobile Pentium 4-M and Mobile Celeron Processor
  - FSB speed 400/533/800* MHz
  - With standard CPU retention for easy heat sink and fan installation
- **Main memory**
  - Two 184-pin DIMM sockets
  - Supports 200/266/300/400*Mhz DDR SDRAM up to 2GB
  - Available bandwidth up to 3.2GB/s (DDR400*)
  - 64/128/256/512 MB SDRAM technologies
  - 2.5V DDR SDRAM support
  - Registered DIMM not supported
  - Do not support ECC functionality
- **System BIOS**
  - Award BIOS
  - 4Mbit flash ROM (Intel FWH) for easy upgrade
  - Support DMI, PnP, Green function and ACPI
  - ACPI support suspend to RAM, USB wake up
- **On Board I/O**
  - PCI IDE Interface
    Support two enhanced IDE channel up to four HDDs with PIO mode 4, Ultra DMA/33/66/100 model transfer and Bus master feature.
  - Floppy Drive Interface
    Support one FDD port up to two floppy drives 1.44MB diskette format
  - Type II Compact Flash
    True IDE mode, compatibles with the ATA/ATAPI-4 specification, bootable for no drives on primary channel
  - Serial Ports
    Support two high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs RS-232/422/485 selectable for COM2 by jumper
  - IR Interface
    Support one 6-pin header for serial Standard Infrared wireless communication Shared with one serial port
  - USB Interface
    USB 2.0 compliant
    Support six USB (Universal Serial Bus) ports for high-speed I/O peripheral devices
    Two on bracket (dedicated for keyboard & mouse); four with pin header

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- PS/2 Mouse and Keyboard Interface
  Support one 10-pin box header for PS/2 mouse/keyboard connection through PS/2 keyboard and mouse cable with bracket

- **Auxiliary I/O**
  - One 2-pin system reset switch
  - One 4-pin external speaker interface
  - One 5-pin key-lock header
  - One 2-pin HDD active indicator interface
  - Two 10-pin USB dual port interface
  - One 4-pin ATX power control interface
  - One 10-pin connector for GPIO (4 GPI and 4 GPO)

- **Bracket**
  - Two USB Ports (dedicated for keyboard & mouse)
  - Support two or one RJ45 connectors (LAN)
  - One VGA connector

- **Hardware Monitoring**
  Support CPU voltage, temperature and FAN monitoring

- **Watchdog Timer**
  - Support WDT function through software programming
  - Software programmable time-out internal setting
  - Generate system reset

- **Real Time Clock/Calendar (RTC)**
  - Support Y2K Real Time Clock/Calendar with battery backup for 7-year data retention
  - A high quality external Li battery

- ACPI compliant support the Full-On (S0), Power-On-Suspend (S1), Suspend to RAM (S3), Suspend to Disk (S4), and Soft-Off (S5) power management states.

- **ATX Power Control Interface**
  One 4-pin header to support ATX power control with Modem Ring-On and Wake-On-LAN function

- **Auxiliary I/O Interfaces**

- System reset switch, external speaker, Keyboard lock and HDD active LED, etc.CPU Cooling Fan
  Support one 3-pin header with wafer

Remark "*" -

- 800MHz front side bus is over clocking over Intel 845GV chipset, customers must to validate your own application before adopt this feature.

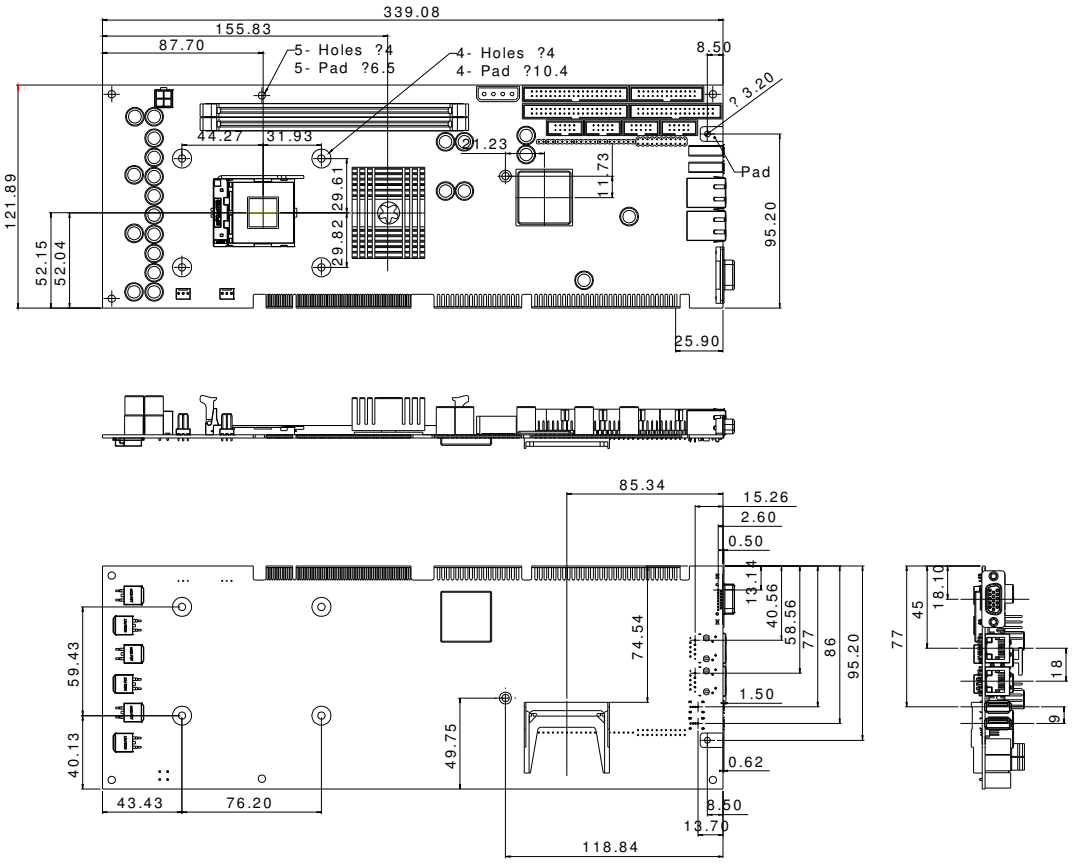
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Additional Main Peripheral Function

- On Board High performance Graphics (Intel GMCH Integrated Graphics controller)
  - IGD with analog display port
  - Analog Display Support up to 2048 x 1536 @ 60Hz refresh
  - AGP 2.0, AGP 4X. 1.5V
  - Software DVD at 30 fps, full screen
  - Motion Video Acceleration
- Dual or single on-board Ethernet
  - Support 10BASE-T/100BASE-TX/1000BASE-T (combination depends on model)
  - Dual or single RJ-45 connector
  - Support two LEDs to indicator LAN access and link status on RJ45 jack
  - Support Wake-on-LAN (The port aside VGA port)
- PICMG Compliant PCI plus ISA bus Interface
  - Follow PICMG 1.0 Rev 2.0 standard (32-bit PCI and 16-bit ISA)
  - Fully complies with PCI Local Bus specification V2.1 (support 4 master PCI slots)
- On Board PCI to ISA Bridge
  - Support ISA Bus mastering
  - Support standard ISA slot
  - 64mA high driving
- ISA64 High ISA-Bus Driving Capability
  Support 64mA high driving capability for ISA-Bus slots on back plane
- Physical and Environmental requirements
  - Outline Dimension (L x W) 338.5mm (13.33″) X 122mm (4.8″)
  - Power Requirements:
    . +12V (CPU) @6.76A
    . +12V (System) @0.02A
    . +5V @4.0A
  - Test configuration:
    . CPU: Intel P4 2.8GHz/800MHz FSB/1024KB L2 Cache
    . Memory: DDR SDRAM 512MBx2
    . Primary Master IDE HDD: Seagate ST320014A (20GB)
    . OS: Microsoft Windows 2000 professional with SP4
    . Test Programs: 3D Mark 2001 Pro for loading VGA and Burning Test V4.0 for CPU loading
    . Connected Fans: Only CPU fan connected
    . Run Time: 10 minutes
  - Operating Temperature: 0°C ~ 55°C (32°F ~ 131°F)
  - Storage Temperature: -20°C ~ 80°C
  - Relative Humidity: 0% ~ 95%, non-condensing

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1.3.1 Mechanical Drawing

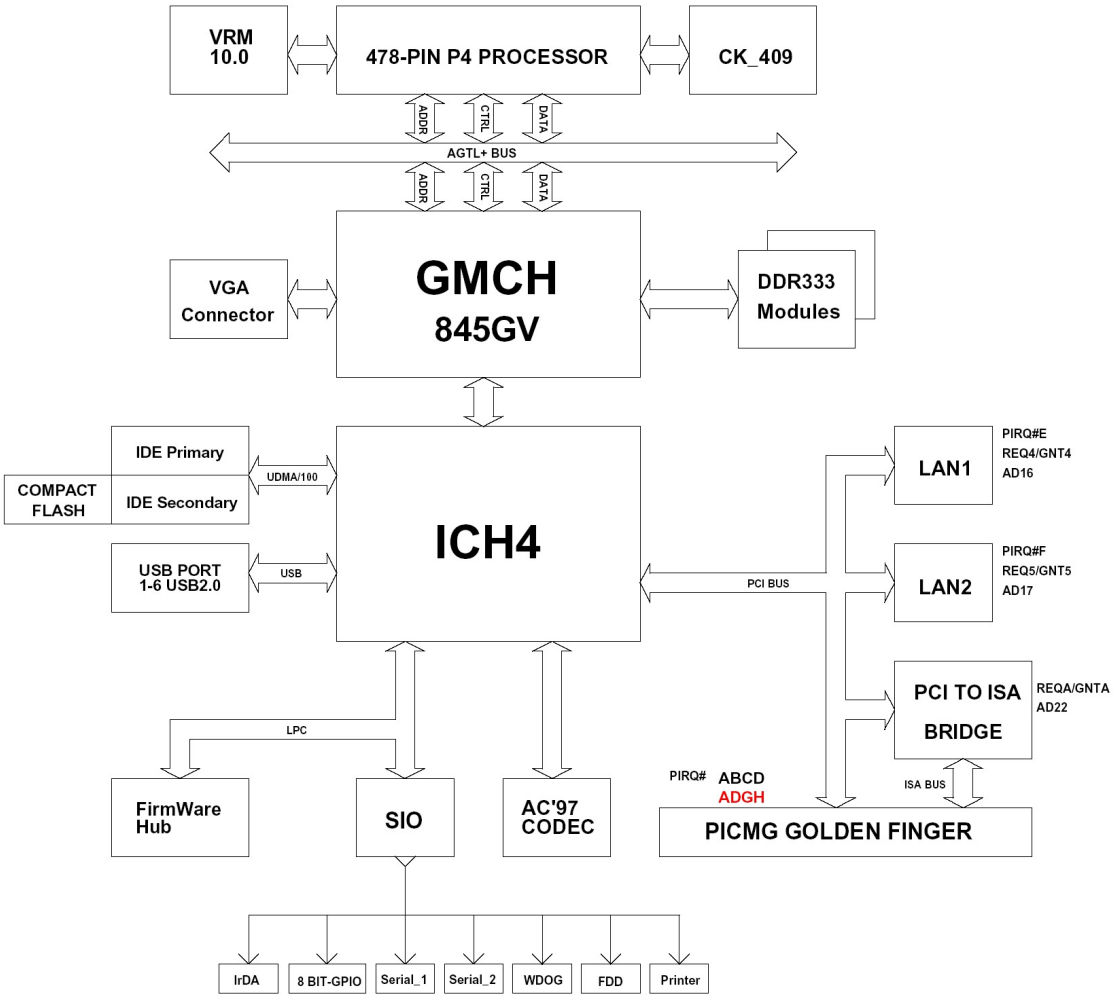


1.4 System Architecture

The system architecture of ROBO-8712E series includes two main Intel chips, Intel 845GV chipset supports Pentium-4/Celeron (D)/Mobile Pentium 4-M/Mobile Celeron processor, DDR-SDRAM, 2D/3D graphic display, and ICH4 supports PCI bus interface, APM, ACPI compliant power management, USB ports, SMBus communication, and Ultra DMA/33/66/100 IDE Master. The W83627HF (I/O Controller) is responsible for PS/2 Keyboard/Mouse, UARTs, Hardware Monitor, Watch Dog Timer and Infrared interface.

The PCI-to-ISA bridge supports a standard 16-bit ISA bus interface which is applied for all slower I/O operations. In ROBO-8712E series, it supports Type II CompactFlash disk.

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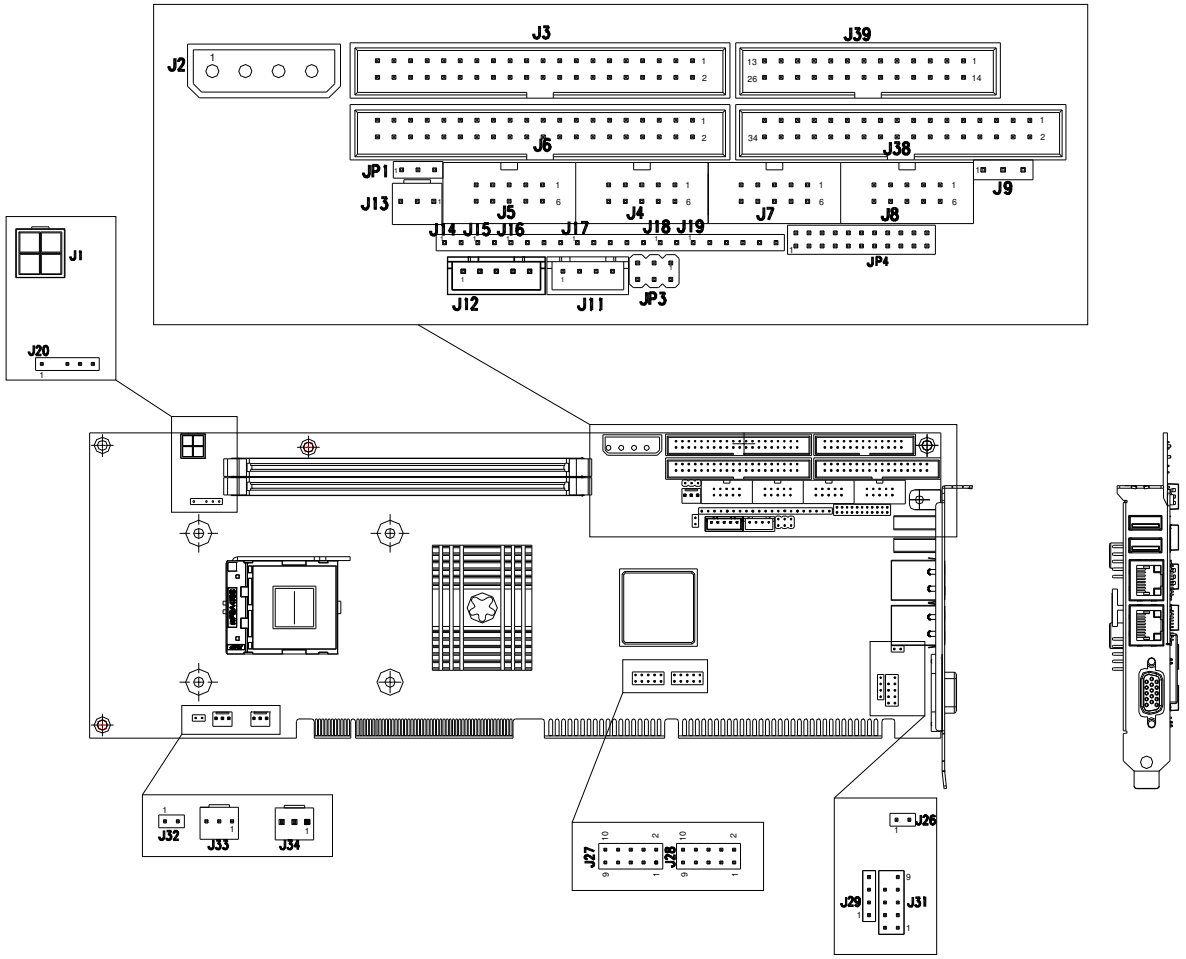
ROBO-8712E System Block Diagram

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Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on ROBO-8712E series are in the proper position. The default settings shipped from factory are marked with a star (★).

2.1 Jumper Setting



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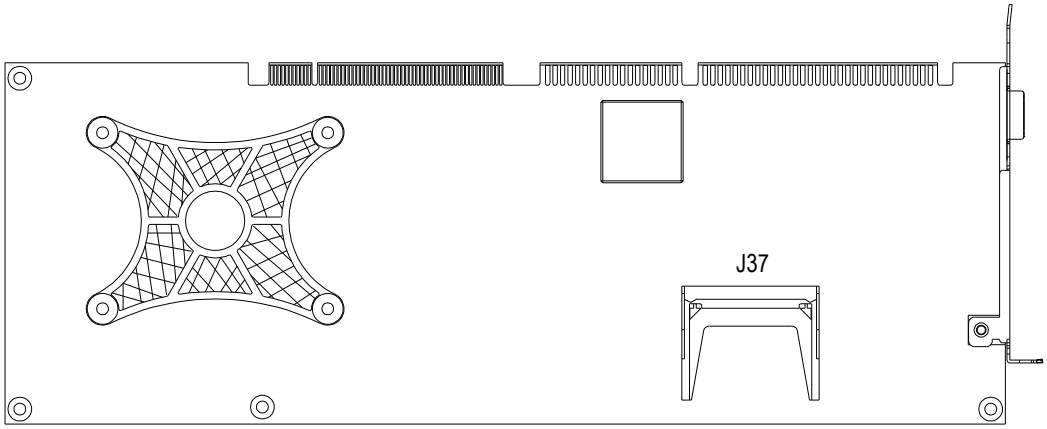


Figure 2-1 ROBO-8712E Jumper/Connector Location

JP1 : RTC CMOS Clear Jumper Setting

JP1	Process Selection
1-2	Normal Operation ★
2-3	Clear CMOS Contents

JP3 : AT/ATX Power Supply Selection

JP3	Process Selection
3-5, 4-6	ATX Power Supply ★
1-3, 2-4	AT Power Supply

JP4 : COM2 RS232/485/422 Selection

JP4	Process Selection
RS232	5-6,9-11,10-12,15-17,16-18 ★
RS485	1-2,7-9,8-10,19-20
RS422	3-4,7-9,8-10,13-15,14-16,21-22

J32 : Mobile Pentium 4/Northwood(Prescott) Selection

J32	Process Selection
Open	Normal Support
Short	Mobile Pentium 4 MPM Support

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2.2 Connector Allocation

I/O peripheral devices and flash disk are connected to the interface connectors and DOC socket on this single board computer (Figure 2-1)

Connector Function List

Connector	Description	Remark
J1	4P Header for CPU 12V Power	
J2	4P Header for System Power	
J3	IDE1 Interface Connector	
J4	PS/2 Keyboard/Mouse Connector	
J5	8-Bit GPIO Header	
J6	IDE2 Interface Connector	
J7	Serial Port-1 Connector	
J8	Serial Port-2 Connector	
J9	External Wake on LAN Header	
J11	4 Pin Header Backplane 5VSB, PS_ON, and ATX PWROK PS_ON, and ATX PWROK	
J12	External Keyboard Connector	
J13/J33/J34	Fan Header	
J14	Power On Header	
J15	Reset Header	
J16	External Speaker Header	
J17	Keyboard Lock Header	
J18	HDD LED Header	
J19	IR Header	
J20	External SMBus Header	
J21/J23	Bracket Side USB Connector	
J22/J26	Ethernet Link LED Header	
J24/J25	Ethernet RJ-45 Interface Connector	
J27/J28	2 Port USB Header	
J29	CD-IN Header	
J30	D-SUB 15 VGA Connector	
J31	On-Board AC97 Audio Header	
J32	Mobile Pentium 4/Northwood (Prescott) Selection	
J37	Compact Flash Socket on IDE1 Master	
J38	FDC Interface Connector	
J39	Printer Interface Connector	

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Pin Assignments of Connectors

J1: 4P Header for CPU 12V Power

PIN No.	Signal Description
1	GND
2	GND
3	+12V
4	+12V

J2: 4P Header for System Power

PIN No.	Signal Description
1	+12V
2	GND
3	GND
4	+5V

J3 /J6: IDE1/IDE2 Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

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J37: Compact Flash Socket on IDE1 Master

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	SDCS#0	8	Ground
9	Ground	10	Ground
11	Ground	12	Ground
13	+5V	14	Ground
15	Ground	16	Ground
17	Ground	18	SA2
19	SA1	20	SA0
21	Data 0	22	Data 1
23	Data 2	24	NC
25	NC	26	NC
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	SDCS#3
33	Ground	34	IOR#
35	IOW#	36	WE#
37	INT	38	+5V
39	Ground	40	NC
41	RESET#	42	IORDY
43	NC	44	REQ
45	IDEACT#	46	PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

J4: PS/2 Keyboard/Mouse Connector

PIN No.	Signal Description
1	Mouse Data
2	N/C
3	GND
4	+5V
5	Mouse Clock
6	Keyboard Data
7	N/C
8	Ground
9	+5V
10	Keyboard Clock

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J5: 8-Bit GPIO Header

PIN No.	Signal Description
1	GPIO10
2	GPIO11
3	GPIO12
4	GPIO13
5	GND
6	GPIO14
7	GPIO15
8	GPIO16
9	GPIO17
10	+5V

J7/J8 : Serial Port-1/Port-2 Connector

PIN No.	Signal Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)
10	N/C

J9: External Wake on LAN Header

PIN No.	Signal Description
1	5VSB
2	GND
3	RI

J11: 4 Pin Header Backplane 5VSB, PS_ON, and ATX PWROK

PIN No.	Signal Description
1	ATX Power Ok
2	5VSB
3	PS_ON#
4	GND

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J12: External Keyboard Connector

PIN No.	Signal Description
1	Keyboard Clock
2	Keyboard Data
3	NC
4	GND
5	+5V

J13/J33/J34: Fan Header

PIN No.	Signal Description
1	GND
2	+12V
3	Speed Sense to SIO

J14: Power On Header

PIN No.	Signal Description
1	5VSB
2	Power On

J15: Reset Header

PIN No.	Signal Description
1	Reset
2	GND

J16: External Speaker Header

PIN No.	Signal Description
1	Speaker
2	NC
3	GND
4	+5V

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J17: Keyboard Lock Header

PIN No.	Signal Description
1	+5V
2	NC
3	Power/Suspend LED
4	Key lock#
5	GND

J18: HDD LED Header

PIN No.	Signal Description
1	+5V
2	IDEACT#

J19: IR Header

PIN No.	Signal Description
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

J20: External SMBus Header

PIN No.	Signal Description
1	SMBCLK
3	GND
4	SMBDATA
5	+5v

J21/23: Bracket Side USB Connector

PIN No.	Signal Description
1	Vcc (Stand By)
2	D-
3	D+
4	GND

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J27/J28 : 2 Port USB Header

PIN No.	Signal Description
1	VCC
2	Shield GND
3	D0-
4	GND
5	D0+
6	D1+
7	GND
8	D1-
9	Shield GND
10	VCC

J24/25: Ethernet RJ-45 Interface Connector

PIN No.	Signal Description
1	MDI_2P
2	MDI_0P
3	MDI_0N
4	+1.8V
5	MDI_2N
6	MDI_3P
7	GND
8	MDI_1P
9	MDI_1N
10	MDI_3N
11	ACT#
12	LINK#
13	LINK100#
14	LINK1000#

J22/26: Ethernet Link LED Header

PIN No.	Signal Description
1	ACT#
2	LINK#

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J29: CD-IN Header

PIN No.	Signal Description
1	CD-L
2	CDGND
3	CDGND
4	CD-R

J31: On-Board AC97 Audio Header

PIN No.	Signal Description
1	MIC Power
2	AGND
3	LINE IN Left
4	AGND
5	LINE IN Right
6	AGND
7	LINE OUT Left
8	AGND
9	LINE OUT Right

J30: D-SUB 15 VGA Connector

PIN No.	Signal Description
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	DDC DATA
13	HSYNC
14	VSYNC
15	DDC CLK

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J38: FDC Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	Density Select 0
3	GND	4	N/C
5	GND	6	Density Select 1
7	GND	8	Index#
9	GND	10	Motor ENA#
11	GND	12	Drive Select B#
13	GND	14	Drive Select A#
15	GND	16	Motor ENB#
17	GND	18	Direction#
19	GND	20	Step#
21	GND	22	Write Data#
23	GND	24	Write Gate#
25	GND	26	Track 0#
27	GND	28	Write Protect#
29	N/C	30	Read Data#
31	GND	32	N/C
33	N/C	34	Disk Change#

J39: Printer Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper Empty	25	GND
13	Printer Select	26	N/C

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Chapter 3
System Installation

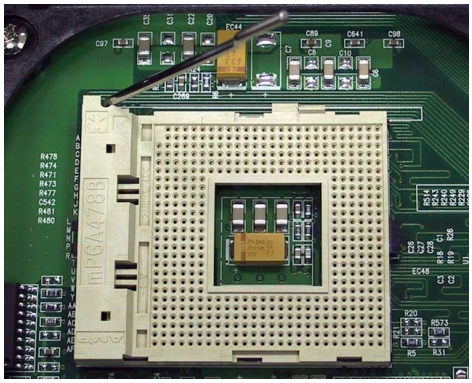
This chapter provides you with instructions to set up your system. The additional information is enclosed to help you install Compact Flash disk, set up onboard PCI device and handle WDT operation in software programming.

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle WDT operation in software programming.

3.1 Pentium 4 Processor

Installing Socket 478 CPU

1) Lift the handling lever of CPU socket outwards and upwards to the other end.



2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.

3) Push down the lever to lock processor chip into the socket once CPU fits.

4) Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the socket 478.

Note:
You should know Pentium 4 processor need extra 12V power source. DON'T FORGET TO CONNECT 4pin 12V connector to J1!

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Removing CPU

1) Unlock the cooling fan first.
2) Lift the lever of CPU socket outwards and upwards to the other end.
3) Carefully lifts up the existing CPU to remove it from the socket.
4) Follow the steps of installing a CPU to change to another one or place handling bar to close the opened socket.

Configuring System Bus

ROBO-8712E series will automatically detect the CPU used. CPU speed of Intel P4 can be detected automatically.

3.2 Main Memory

ROBO-8712E series provides two DDR-SDRAM DIMM sockets to support DDR-SDRAM as main memory. The maximum memory size can be up to 2GB. Auto detecting memory clock according to BIOS CMOS settings.

For system compatibility and stability, don't use memory module without brand. You can also use only one double-sided DIMM in either one DIMM slot or two single-sided DIMM in both slots.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install your DRAM module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

Memory frequency / CPU FSB synchronization
ROBO-8712E series support different memory frequencies depending on the CPU front side bus and the type of DDR DIMM.

CPU FSB	Memory Frequency
800MHz	400MHz
533MHz	333/266MHz
400MHz	266MHz

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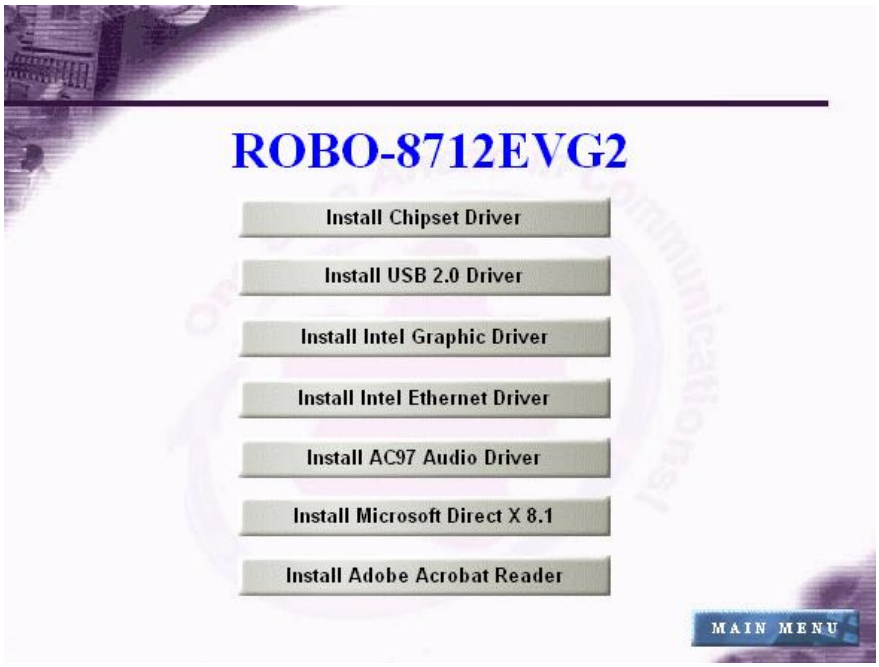
3.3 Installing the Single Board Computer

To install your ROBO-8712E series into standard chassis or proprietary environment, you need to perform the following:

Step 1: Check all jumpers setting on proper position
Step 2: Install and configure CPU and memory module on right position
Step 3: Place ROBO-8712E series into the dedicated position in your system
Step 4: Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that your SBC is properly inserted and fixed by mechanism. Otherwise, the system might be unstable or do not work due to bad contact of PICMG 1.0 PCI plus ISA-bus slot.

Note:
Please refer to section 3-4-1 to 3-4-3 to install INF/VGA/LAN drivers.



3.3.1 Chipset Component Driver

The chipset on ROBO-8712E series is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 98SE /2000 /XP / Server 2003, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in ROBO-8712E series CD-title.

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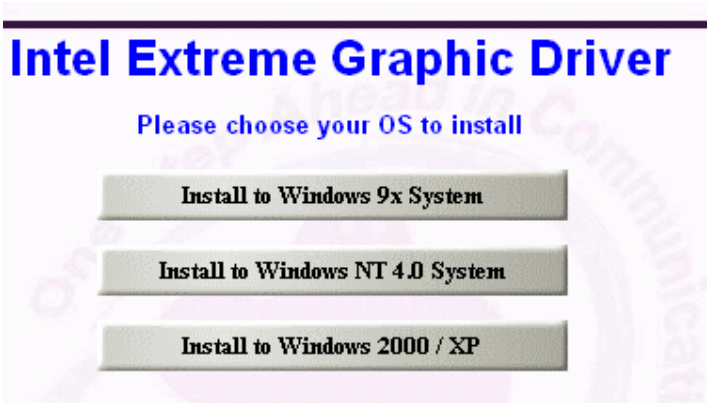
3.3.2 Intel Integrated Graphics GMCH Chip

Using GMCH High performance graphic integrated chipset is aimed to gain an outstanding graphic performance. Shared 8 accompany it to 64MB system DDR-SDRAM with Intel DVMT. This combination makes ROBO-8712E series an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI or ISA VGA card can take over the system display.

Drivers Support

Please find 845G/GV GMCH driver in the ROBO-8712E series CD-title. Drivers support Windows 98/98SE/2000 / XP, Windows-NT 4.0.



(1) Windows-98/98SE: Please execute Install to Windows 9x System file to start graphics driver installation.
(2) Windows-NT 4.0: Please install Windows-NT 4.0 Service Pack 4 or above first, please execute Install to Windows NT4.0 System file to start graphics driver installation.
(3) Windows-2000/XP: Please execute Install to Windows 2000 / XP System file to start graphics driver installation.

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3.3.3 On-board Fast Ethernet Controller

Drivers Support

Please find Intel ICH4 LAN & Intel 82541GI Gigabit LAN driver in /Ethernet directory of ROBO-8712E series CD-title. The drivers support Windows-98 / 98SE / NT4.0 / 2000 / XP, and only Windows 95 for ICH4 LAN.



LED Indicator (for LAN status)

ROBO-8712EVLA provides three LED indicators to report 82551QM Fast Ethernet interfaces status. Please refer to the table below as a quick reference guide.

82551QM	Name of LED	Operation of Ethernet Port	
		ON	OFF
Green	LAN Linked & Active LED	Linked	Active (Blinking)
Green	LAN speed LED	100 Mbps	10 Mbps

LED Indicator (for LAN status)

ROBO-8712EVG2A provides two LED indicators to report Intel 82541GI x2 Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

82541GI	Color	Name of LED	Operation of Ethernet Port		
			ON	OFF	
Status LED	Green	LAN Linked & Active LED	Linked	Active (Blinking)	
Speed LED	Orange	LAN speed LED	Giga Mbps	100 Mbps	10 Mbps
	Green		Orange	Green	Off

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3.3.4 On-board AC-97 Audio Device

Please find Realtek AC'97 Audio driver of ROBO-8712E series CD-title. The drivers support Windows-95 / NT4.0 / 98SE / ME / 2000 / XP, and AC97 Utility.



3.4 Clear CMOS Operation

The following table indicates how to enable/disable CMOS Clear Function hardware circuit by putting jumpers at proper position.

JP1	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS contents

To correctly operate CMOS Clear function, users must turn off the system, move JP1 jumper to short pin 2 and 3. To clear CMOS contents, please turn the power back on and turn it off again for AT system, or press the toggle switch a few times for ATX system. Move the JP1 back to 1-2 position (Normal Operation) and start the system. System will then produce a "CMOS Check Sum Error" message and hold up. Users may then follow the displayed message to load BIOS default setting.

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3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

ROBO-8712E series allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627HF data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);
// Assign Pin 89 to be a WDTO
outp(0x002E, 0x2B);
outp(0x002F, inp(0x002F) & 0xEF);
// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);
// Active Logic Device 8
outp(0x002E, 0x30);
outp(0x002F, 0x01);
```


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```
// Select Count Mode
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register  & 0x08));
// Specify Time-out Value
outp(0x002E, 0xF6);
outp(0x002F,  Time-out Value Register );
// Disable WDT reset by keyboard/mouse interrupts
outp(0x002E, 0xF7);
outp(0x002F, 0x00);
// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Value of Count-mode Register:
1) 0x00 -- Count down in seconds (Bit3=0)
2) 0x08 -- Count down in minutes (Bit3=1)
Value of Time-out Value Register:
1) 0x00 -- Time-out Disable
2) 0x01~0xFF -- Value for counting down

3.6 On-Board USB 2.0 Controller

Drivers Support

Please find Intel ICH4 USB driver in /USB20 directory of ROBO-8712E series CD-title. The drivers support Windows-2000 and Windows-XP.



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3.7 GPIO

The ROBO-8712E series provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

3.7.1 Pin assignment

J5: General Purpose I/O Connector

PIN No.	Signal Description
1	General Purpose I/O Port 1 (GPIO10)
2	General Purpose I/O Port 2 (GPIO11)
3	General Purpose I/O Port 3 (GPIO12)
4	General Purpose I/O Port 4 (GPIO13)
5	Ground
6	General Purpose I/O Port 5 (GPIO14)
7	General Purpose I/O Port 6 (GPIO15)
8	General Purpose I/O Port 7 (GPIO16)
9	General Purpose I/O Port 8 (GPIO17)
10	+5V

3.7.2 Programming Guide

There are 8 GPIO pins on ROBO-8712E series. These GPIO pins are from SUPER I/O (W83627HF) GPIO pins, and can be programmed as Input or Output direction.

J5 pin header is for 8 GPIO pins and its pin assignment as following:

J5_Pin1=GPIO1: from SUPER I/O_GPIO10 with Ext. 4.7K PH
J5_Pin2=GPIO2: from SUPER I/O_GPIO11 with Ext. 4.7K PH
J5_Pin3=GPIO3: from SUPER I/O_GPIO12 with Ext. 4.7K PH
J5_Pin4=GPIO4: from SUPER I/O_GPIO13 with Ext. 4.7K PH
J5_Pin6=GPIO5: from SUPER I/O_GPIO14 with Ext. 4.7K PH
J5_Pin7=GPIO6: from SUPER I/O_GPIO15 with Ext. 4.7K PH
J5_Pin8=GPIO7: from SUPER I/O_GPIO16 with Ext. 4.7K PH
J5_Pin9=GPIO8: from SUPER I/O_GPIO17 with Ext. 4.7K PH

<<<<< Be careful Pin5=GND, Pin10=VCC >>>>>

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There are several Configuration Registers (CR) of W83627HF needed to be programmed to control the GPIO direction, and status (GPI)/value (GPO). CR00h ~ CR2F are common (global) registers to all Logical Devices (LD) in W83627HF. CR07h contains the Logical Device Number that can be changed to access the LD as needed. LD7 contains the GPIO10~17 registers.

Programming Guide:

Step1: CR2A_Bit [7.2]. P [1,1,1,1,1,1]; to select multiplexed pins as GPIO10~17 pins
Step2: LD7_CR07h.P [07h]; Point to LD7
Step3: LD7_CR30h_Bit0.P1; Enable LD7
Step4: Select GPIO direction, Get Status or output value.

LD7_CRF0h; GPIO17 ~ 10 direction, 1 = input, 0 = output pin
LD7_CRF2h.P [00h]; Let CRF1 (GPIO data port) non-invert to prevent from confusion
LD7_CRF1h; GPIO17~10 data port, for input pin, get status from the related bit, for output pin, write value to the related bit.

For example,

LD7_CRF0h_Bit4.P0; Let GPIO14 as output pin
LD7_CRF2h_Bit4.P0; Let CRF1_Bit4 non-inverted
LD7_CRF1h_Bit4.P0; Output "0" to GPIO14 pin (J5_Pin6)

LD7_CRF0h_Bit0.P1; Let GPIO10 as input pin
LD7_CRF2h_Bit0.P0; Let CRF1_Bit0 non-inverted
Read LD7_CRF1h_Bit0; Read the status from GPIO10 pin (J5_Pin1)

1) 0x2E - EFER (Extended Function Enable Register, for entering Extended Function Mode)
- EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F - EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIO.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);
// Assign Pin121-128 to be GPIO port 1
outp(0x002E, 0x2A);
outp(0x002F, inp(0x002F) | 0x84);
// Select Logic Device 7
outp(0x002E, 0x07);
outp(0x002F, 0x07);
```


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```
// Active Logic Device 7
outp(0x002E, 0x30);
outp(0x002F, 0x01);
// Select Inversion Mode
outp(0x002E, 0xF2);
outp(0x002F, (inp(0x002F) & 0x0F) | ( Inversion Register  & 0xF0));
// Select I/O Mode
outp(0x002E, 0xF0);
outp(0x002F, (inp(0x002F) & 0x0F) | ( I/O Selection Register  & 0xF0));
// Access GPIO ports
outp(0x002E, 0xF1);
outp(0x002F, (inp(0x002F) & 0x0F) | ( Output Data  & 0xF0));
or
 Input Data  = inp(0x002F);
// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Each bit in the high nibble of each Register represents the setting of a GPIO port.

Bit4 vs. GPIO port 1
Bit5 vs. GPIO port 2
Bit6 vs. GPIO port 3
Bit7 vs. GPIO port 4

Value of Inversion Register:
Only high nibble is available for this function.
When set to a '1', the incoming/outgoing port value is inverted.
When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of I/O Selection Register:
Only high nibble is available for this function.
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.

Value of Output Data / Input Data:
Only high nibble is available for this function.
If a port is assigned to be an output port, then its respective bit can be read/written.
If a port is assigned to be an input port, then its respective bit can be read only.

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Chapter 4
BIOS Setup Information

ROBO-8712E series is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, ROBO-8712E series communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

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

Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

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4.2 Main Menu

Once you enter ROBO-8712E series AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix- AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features ▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations ▶ PC Health Status	▶ Frequency/Voltage Control Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving
ESC : Quit F9 : Menu in BIOS ↑↓→← : Select Item F10 : Save & Exit Setup	
Time, Date, Hard Disk Type …	

Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

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4.3 Standard CMOS Setup Menu

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, **Drive type**, and **Boot Sector Virus Protection Status**.

Phoenix- AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Thu, Apr 7 2005	Item Help
Time (hh:mm:ss)	12 : 29 : 50	
▶ IDE Primary Master	[ST340015A]	Menu Level ▶
▶ IDE Primary Slave	[None]	
▶ IDE Secondary Master	[CD-540E]	Change the day, month, year and century
▶ IDE Secondary Slave	[None]	
Drive A	[1.4M, 3.5 in.]	
Drive B	[None]	
Video	[EVG/VGA]	
Base Memory	640K	
Extended Memory	1039360K	
Total Memory	1040384K	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Primary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu	Press <Enter> to enter the next page for detail hard drive settings
IDE Secondary Master	Options are in its sub menu	Press <Enter> to enter the next page for detail hard drive settings

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IDE Secondary Slave	Options are in its sub menu	Press <Enter> to enter the next page for detail hard drive settings
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Press <Enter> to enter the next page for detail hard drive settings
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Base Memory	640K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as hard disk drive or cdrom drive. It uses a separate sub menu to configure each hard disk drive.

Phoenix- AwardBIOS CMOS Setup Utility
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level ▶
Access Mode	Auto	
Capacity	40022 MB	To atuo-detect the HDD's size, head … on this channel
Cylinder	19158	
Head	16	
Precomp	0	
Landing Zone	19157	
Sector	255	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

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■ **Menu Selections**

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

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4.5 Advanced BIOS Feature

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

Phoenix- AwardBIOS CMOS Setup Utility
Advanced BIOS Features

		Item Help
▶ CPU Feature	[Press Enter]	
Virus Warning	[Disabled]	
CPU L1 & L2 Cache	[Enabled]	Menu Level ▶
Hyper-Threading Technology	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot Device	[HDD-0]	
Second Boot Device	[HDD-1]	
Third Boot Device	[ZIP100]	
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot up Floppy Seek	[Enabled]	
Boot up NumLock Status	[On]	
Gate A20 Option	[Normal]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	[Setup]	
X APIC Mode	Enabled	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
Console Redirection	[Disabled]	
X Baud Rete	19200	
Agent Connect via	[NULL]	
Agent wait time(min)	[1]	
Agent after boot	[Disabled]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

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Phoenix- AwardBIOS CMOS Setup Utility
CPU Feature

Thermal Management	Thermal Monitor 1	Item Help
Limit CPUID MaxVal	[Disabled]	Menu Level ▶ Set Limit CPUID MaxVal to 3, Should Be "Disabled" for WinXP

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Limit CPUID Maxval

Set Limit CPUID MaxVal to 3, Should Be "Disabled" for WinXP.

Enabled	For OS: Windows NT4.0 Install.
Disabled	For OS: Windows XP Install.

Virus Warning

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

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

CPU L1 Cache/L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable Cache
Disabled	Disable Cache

Hyper-Threading Technology

"Enabled" for Windows XP and Linux 2.4.X (OS optimized for Hyper-Threading Technology and "Disabled" for other OS (OS not optimized for Hyper-Threading Technology).

The choice: Enabled, Disabled.

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Quick Power On Self Test

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

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third Boot Device

Select your boot device priority.

The choice: Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2 HDD3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN and Disabled.

Boot Other Device

Select your boot device priority.

The choice: Enabled, Disabled.

Swap Floppy Drive

If the system has two floppy drives, choose enable to assign physical driver B to logical drive A and Vice-Versa.

The choice: Enabled, Disabled.

Boot Up Floppy Seek

Enabled tests floppy drives to determine whether they have 40 or 80 tracks.

The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control Gate A20 and Normal – a pin in the keyboard controller controls Gate A20. Default is Fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller – When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled, Disabled.

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Typematic Rate (Chars/sec)

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

The choice: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic delay (Msec)

The delay before keystrokes begin to repeat.

The choice: 250, 500, 750, and 1000.

Security Option

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

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

APIC Mode

The choice: Enabled, Disabled.

MPS Version Control For OS

The choice: 1.1, 1.4.

OS Select For DRAM > 64MB

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

The choice: Non-OS2, OS2.

Console Redirection

Enabled	Attempt to redirect console via COM port.
Disabled	Attempt to redirect console when keyboard absent.

Baud Rate

Specify Baud Rate of console redirection.

The choice: 9600, 19200, 38400, 57600, and 115200.

Agent Connect via

Connection modes: NULL – Direct connection Agent wait time (min).

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Agent wait time (min)

Timeout for connection.

The choice: 1, 2, 4, and 8.

Agent after boot

Keep Agent running after OS boot.

The choice: Enabled, Disabled.

Small Logo (EPA) Show

The choice: Enabled, Disabled.

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4.6 Advanced Chipset Feature

This section allows you to configure the system based on the specific features of the Intel 82845GV chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM (DDR SDRAM) and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selectable	[By SPD]	Item Help
X CAS Latency Time	2.5	
X Active to Precharge Delay	7	Menu Level ▶
X DRAM RAS# to CAS# Delay	3	
X DRAM RAS# Precharge	3	
Memory Frequency For	[Auto]	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Enabled]	
Memory Hole At 15M-16M	[Disabled]	
Delayed Transaction	[Enabled]	
Delay Prior to Thermal	[16 Min]	
AGP Aperture Size (MB)	[64]	
** On-Chip VGA Setting **		
On-Chip VGA	[Enabled]	
On-Chip Frame Buffer Size	[8MB]	
Onboard AC97 Control	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

This chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

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DRAM Timing Selectable

This option provides DIMM plug-and-play support by serial presence detect (SPD) mechanism via the system management bus (SMBUS) interface.

The choice: Manual, By SPD.

CAS Latency Time

This option controls the number of SCLKs between the time a read command is sampled by the SDRAMs and the time the GMCH samples correspondent data from the SDRAMs.

The choice: 1.5, 2, 2.5 SCLKs.

Active to Precharge Delay

This is to DDR standard accordingly.

The choice: 7, 6, and 5.

DRAM RAS# to CAS# Delay

This option controls the number of SCLKs (SDRAM Clock) from a row activate command to a read or write command. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. Normally, the option will be set to Auto.

The choice: 2 or 3.

DRAM RAS# Precharge

This option controls the number of SCLKs for RAS# precharge. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. It is set to auto normally.

The choice: 2 or 3.

Memory Frequency For

Users are recommended to use Auto for memory frequency selection; Use DDR400 selects Auto.

The choice: DDR266, DDR333, Auto.

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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 choice: Enabled, Disabled.

Video BIOS Cacheable

Select "Enabled" to enable caching VGA BIOS into L2 cache to get higher display performance. "Disabled" to ignore this BIOS caching function.

The choice: Enabled, Disabled.

Memory Hole At 15-16M

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The choice: Enabled, Disabled.

Delayed Transaction

Select "Enabled" to enable delay transaction. This will enhance performance for data transmission between different PCI buses.

The choice: Enabled, Disabled.

Delay Prior to Thermal

The choice: 4 Min, 8 Min, 16 Min, and 32 Min.

AGP Aperture Size (MB)

The choice: 4, 8, 16, 32, 64,128, and 256.

On-Chip VGA

The choice: Enabled, Disabled.

On-Chip Frame Buffer Size

Users can set the display memory size that shared from main memory.

The choice: 1MB, 8MB.

On board AC97 Control

Users can disable on board AC97 Audio function.

The choice: Enabled, Disabled.

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4.7 Integrated Peripherals

Phoenix- AwardBIOS CMOS Setup Utility
Integrated Peripherals

Onboard LAN Boot ROM init	[Disabled]	Item Help
On-Chip Primary PCI IDE	[Enabled]	
IDE Primary Master PIO	[Auto]	Menu Level ▶
IDE Primary Slave PIO	[Auto]	
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
USB Controller	[Enabled]	
USB 2.0 Controller	[Enabled]	
USB Keyboard Support	[Enabled]	
USB Mouse Support	[Disabled]	
Init Display First	[PCI Slot]	
IDE HDD Block Mode	[Enabled]	
POWER ON Function	[BUTTON ONLY]	
X KB Power ON Password	Enter	
X Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	[Enabled]	
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard Serial Port 2	[2F8/IRQ3]	
UART Mode Select	[Normal]	
X RxD, TxD Active	Hi,Lo	
X IR Transmission Delay	Enabled	
X UR2 Duplex Mode	Half	
X Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
X EPP Mode Select	EPP1.7	
X ECP Mode Use DMA	3	
PWRON After PWR-Fail	[Off]	
Watch Dog Timer Select	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

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Onboard LAN Boot ROM init

Select "Enabled" to Onboard Load Boot ROM to shadow RAM.

The choice: Enabled, Disabled.

On-Chip Primary/Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

The choice: Enabled, Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

The choice: Auto, Disabled.

USB Controller

This item allows you to enable/disable USB (Universal Serial Bus) function.

The choice: Enabled, Disabled.

USB 2.0 Controller

This item allows you to enable USB 2.0 controller as to provide high speed USB 2.0 devices connection.

The choice: Enabled, Disabled.

USB Keyboard Support

This item allows you to enable USB keyboard function under POST, BIOS setup menu, DOS, or Windows-NT with no USB driver loaded.

The choice: Enabled, Disabled.

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USB Mouse Support

This item allows you to enabled USB Mouse function under POST, BIOS Setup menu, DOS, or Window-NT with no USB driver loaded.

The choice: Enabled, Disabled.

Init Display First

This item allows you to select the first display port to be initialized.

The choice: PCI Slot, Onboard.

IDE HDD Block Mode

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.

The choice: Enabled, Disabled.

Power On Function

This item allows you to select different power on scheme using ATX power supply.

Password	Power on using customized password string
Hot Key	Power on using special customized key
Mouse Left	Power on using mouse left click
Mouse Right	Power on using mouse right click
Any Key	Power on using any keyboard key
Button Only	Power on by power Button
Keyboard 98	Power on by keyboard 98 [Only power ON/OFF key]

Keyboard Power On Password

In the event of "Power On Function" being configured as "Password", this item will be enabled for tuning. Press "Enter" key to enter a customized password, and confirm again when being asked. In the case that the confirmed password does not match the configured one, the message of "Password Disabled – Press any key to continue…" will be prompted.

Hot Key Power On

In the event of "Power On Function" being configured as "Hot Key", this item will be enabled for tuning.

The choice: Ctrl-F1 to Ctrl-F12.

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Onboard FDC Controller

This item allows you to enable/disable onboard Floppy disk controller.

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This item allows users to select Infrared transmission mode.

Normal	Disable Infrared function
IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission

As Infrared transmission function shares onboard serial port 2, COM2 needs to be enabled.

RxD, TxD Active

This item is to configure Infrared transmission rate. Four options are available :

Hi, Hi	High rate for receiving / High rate for transmitting
Hi, Lo	High rate for receiving / Low rate for transmitting
Lo, Hi	Low rate for receiving / High rate for transmitting
Lo, Lo	Low rate for receiving / Low rate for transmitting

IR Transmission Delay

This option will be available when IR is enabled.

The choice: Enabled, Disabled.

UR2 Duplex Mode

The available choices are full duplex mode and half duplex mode

The choice: Full, Half.

Use IR Pins

The available choices are IR-Rx2Tx2/ RxD2, TxD2.

The choice: IR-Rx2Tx2 / RxD2, TxD2.

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Onboard Parallel Port

This item allows you to configure I/O address of the onboard parallel port.

The choice: Disabled, 378/IRQ7, 278/IRQ5, and 3BC/IRQ7.

Parallel Port Mode

There are four different modes for the onboard parallel port:

SPP	Switch to SPP mode
EPP	Switch to EPP mode
ECP	Switch to ECP mode
ECP + EPP	Switch to ECP + EPP mode
Normal	Switch to Normal mode

EPP Mode Select

Select different version of EPP mode.

The choice: EPP1.7, EPP1.9.

ECP Mode Use DMA

Select a proper DMA channel for ECP mode.

The choice: 3, 1.

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

On	System automatically restores power back
Off	System stays at power –off

Watch Dog Timer Select

This BIOS testing option is able to reset the system according to the selected table.

The choice: Disabled, 10 Sec, 20 Sec, 30 Sec, 40 Sec, 1 Min, 2 Min, 4 Min.

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4.8 Power Management Setup

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

Phoenix- AwardBIOS CMOS Setup Utility
Power Management Setup

	ACPI Function	[Enabled]
	ACPI Suspend Type	[S1(POS)]
X	Run VGABIOS if S3 Resume	No
	Power Management	[User Define]
	Video Off Method	[DPMS]
	Video Off In Suspend	[Yes]
	Suspend Type	[Stop Grant]
	Suspend Mode	[Disabled]
	HDD Power Down	[Disabled]
	Soft-Off by PWR-BTTN	[Instant-Off]
	CPU THRM-Throttling	[50.0%]
	Wake-up by On Board LAN	[Disabled]
	Power On by Ring	[Disabled]
X	USB KB Wake-Up From S3	Disabled
	Resume by Alarm	[Disabled]
X	Date(of Month) Alarm	0
X	Time(hh:mm:ss) Alarm	0 : 0 :0
	** Reload Global Timer Events **	
	Primary IDE 0	[Disabled]
	Primary IDE 1	[Disabled]
	Secondary IDE 0	[Disabled]
	Secondary IDE 1	[Disabled]
	FDD,COM,LPT Port	[Disabled]
	PCI PIRQ[A-D]#	[Disabled]

Item Help

Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

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ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S1(POS), S3(STR).

Run VGA BIOS if S3 Resume

The choice: Auto, Yes, No.

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Defined	Allow you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

Two options are available: Stop Grant and PwrOn Suspend.

The choice: Stop Grant, PwrOn Suspend.

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Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, and 1 Hour.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

CPU THRM-Throttling

When the CPU temperature reaches the preset standard. The CPU usage will be reduced to a selected level to avoid overheating.

The choice: 87.5%, 75.0%, 62.5%, 50.0%, 37.5%, 25.0%, and 12.5%.

Wake-Up by On Board LAN

This option can be enabled to support Wake Up by on-board LAN.

The choice: Disabled, Enabled.

Power On by Ring

When select "Enabled", a system that is at soft-off mode will be alert to Wake-On-Modem signal.

The choice: Enabled, Disabled.

USB KB Wake-up From S3

The choice: Enabled, Disabled.

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Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

Time(hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

FDD, COM, LPT Port

This item is to configure floppy device, COM ports, and parallel port being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

PCI PIRQ[A-D]#

This option can be used to detect PCI device activities. If they are activities, the system will go into sleep mode.

The choice: Enabled, Disabled.

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4.9 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system, which allows I/O devices to operate at speeds nearing the speed the CPU itself, uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix- AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PnP OS Installed	[No]	Item Help
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	Menu Level ▶
X IRQ Resources	Press Enter	
X DMA Resources	Press Enter	Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
PCI/VGA Palette Snoop	[Disabled]	
Assign IRQ For VGA	[Enabled]	
INT Pin 1 Assignment	[Auto]	
INT Pin 2 Assignment	[Auto]	
INT Pin 3 Assignment	[Auto]	
INT Pin 4 Assignment	[Auto]	
INT Pin 5 Assignment	[Auto]	
INT Pin 6 Assignment	[Auto]	
INT Pin 7 Assignment	[Auto]	
INT Pin 8 Assignment	[Auto]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

PNP OS Installed

Select Yes if you are using a plug and play capable operating system; select No if you need to BIOS to configure non-boot devices.

The choice: No, Yes.

Reset Configuration Data

Default is disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

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Resource Controlled By

BIOS can automatically configure all the boot and plug and play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

Enter for more options IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the plug and play standard whether designed for PCI or ISA bus architecture.

The choice: PCI/ISA PnP, Legacy ISA.

DMA Resources

When resources are controlled manually, assign each system DMA channel a type, depending on the type of device using the DMA channel.

Enter for more options DMA-0/DMA-1/DMA-3/DMA-5/DMA-6/DMA-7 assigned to.

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the plug and play standard whether designed for PCI or ISA bus architecture.

The choice: PCI/ISA PnP, Legacy ISA.

PCI/VGA Palette Snoop

The choice: Enabled, Disabled.

Assign IRQ For VGA

To enable VGA IRQ assignation by selecting enabled.

The choice: Enabled, Disabled.

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INT Pin 1 Assignment

Devices (S) using this INT: Display Cntrlr – Bus 0 Dev 2 Func 0, USB 1.0/1.1 UHCI Cntrlr – Bus 0 Dev29 Func 0.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 2 Assignment

Devices (S) using this INT: Multimedia Device – Bus 0 Dev 31 Func 5 Simple COMM. Cntrlr – Bus 0 Dev 31 Func 6 SMBus Cntrlr – Bus 0 Dev 31 Func 3.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 3/Pin 6/Pin 7 Assignment

Devices (S) using this INT: USB 1.0/1.1 UHCI Cntrlr – Bus 0 Dev 29 Func 2.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 4 Assignment

Devices (S) using this INT: USB 1.0/1.1 UHCI Cntrlr – Bus 0 Dev 29 Func 1.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 5 Assignment

Devices (S) using this INT: Network Cntrlr – Bus 1 Dev 0 Func 0.

INT Pin 6 Assignment

Devices (S) using this INT: Network Cntrlr – Bus 1 Dev 1 Func 0.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 7 Assignment

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

INT Pin 8 Assignment

Devices (S) using this INT: USB 2.0 EHCI Cntrlr – Bus 0 Dev 29 Func 7.

The choice: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

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4.10 PC Health Status

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

CPU Warning Temperature	[Disabled]	Item Help
Current System Temperature	38℃/100℉	
Current CPU Temperature	47℃/116℉	Menu Level ▶
Current CPU FAN Speed	6026RPM	
Current System FAN Speed	0 RPM	
Current Power FAN Speed	0 RPM	
CPU Vcore	1.34 V	
+1.5 V	1.64 V	
+3.3 V	3.37 V	
+5 V	5.02 V	
+12 V	12.16 V	
-12 V	-12.44 V	
-5 V	-5.14 V	
UBAT(V)	3.16 V	
5VSB(V)	5.09 V	
CPU Throttle Temperature	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU Warning Temperature

This item allows you to set a temperature above which the system will start the beeping warning. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choices : Disabled, 50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145℉, 66℃/151℉, 70℃/158℉.

CPU Throttle Temperature

This item allows you to set a temperature above, whom the system will operate, in lower speed immediately. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choice: Disabled, 60℃/140℉, 65℃/149℉, 70℃/158℉, 75℃/167℉.

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4.11 Frequency/Voltage Control

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

Spread Spectrum	[Disabled]	Item Help
		Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Spread Spectrum

This item allows you to enable/disable the spread spectrum modulate

The choice: Enabled, Disabled.

4.12 Default Menu

Selecting "Defaults" from the main menu shows you two options which are described below

Load Fail-Safe Defaults

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

Load Fail-Safe Defaults (Y/N) ? N

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

Load Optimized Defaults

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

Load Optimized Defaults (Y/N) ? N

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

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4.13 Supervisor/User Password Setting

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

Set Supervisor Password : can enter and change the options of the setup menus.

Set User Password : just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED

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

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

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4.14 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

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

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

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

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Chapter 5
Troubleshooting

This chapter provides you a few useful tips to quickly get your ROBO-8712E series running with no failure. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

5.1 Quick installation Guide

Backplane

ROBO-8712E series is a full-sized Signal Board Computer, and therefore is only able to run on PICMG PCI/ISA Backplane. To know whether your Backplane is PICMG PCI/ISA Backplane, please contact with vendor or manufacturer.

P4 Power Connector

ROBO-8712E series requires power drawing from two power connectors (J1 and J2), please connect both power connectors. If J2 isn't connected, it could also cause system failed to boot up. (Figure 5-1)

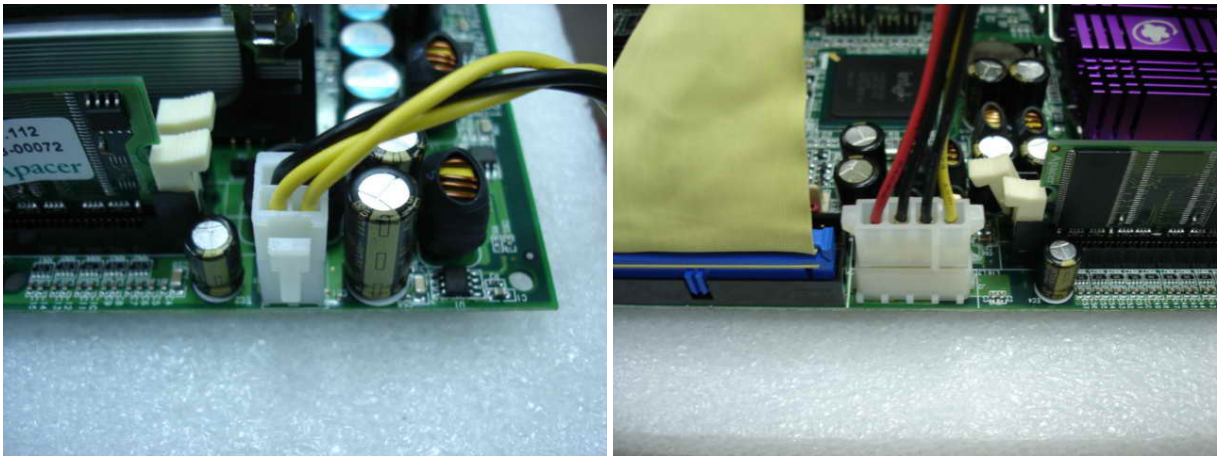


Figure 5-1

ATX Power Setting

This section would be more likely to introduce you how to set up ATX mode on your ROBO-8712E series. Please refer to the following instruction.

Step 1: If you want to use ATX mode, please removed the jumper on pin 3 (PS-ON) and pin 4 (GND) of backplane ATX P/S control connector. And connect 4 pins power cable. (Figure 5-2)

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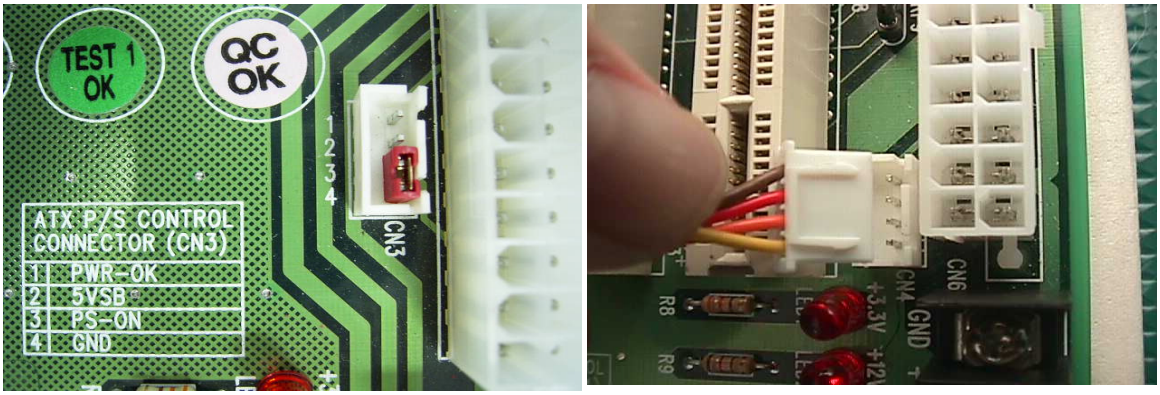


Figure 5-2

Step 2: And then use 4-pin power cable to connect both ATX P/S Control Connector on backplane and ATX Power Control (J11) on Signal Board Computer. (Figure 5-3)

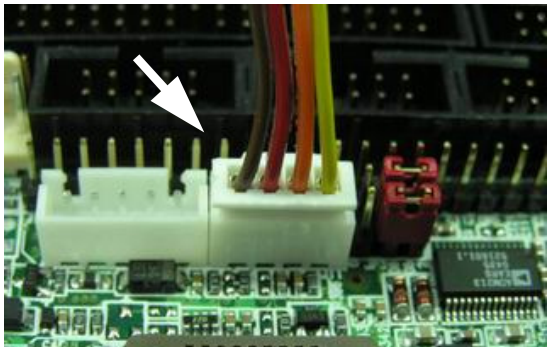


Figure 5-3

Step 3: Please adjust AT/ATX Jumper on JP3 to short 3-5, 4-6 pins, then it can support ATX power scheme. (Figure 5-4)

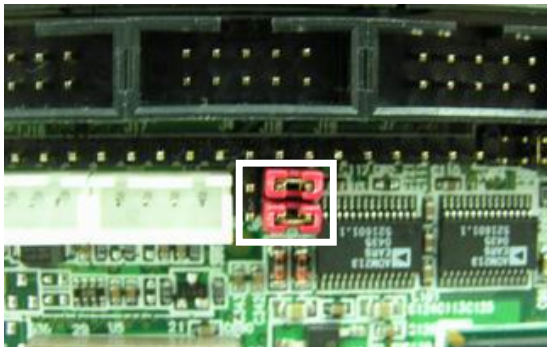


Figure 5-4

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Step 4: Please check the connection of the 12V Power to CPU supplementary Power Connector properly (J1, and J2), which shows on Figure 5-1.

Step 5: Connect TOGGLE SWITCH with J14 connector on ROBO-8712E series (Figure 5-5), which is used to power on ATX Power Supply. Generally, the TOGGLE SWITCH is located on the chassis of front panel.

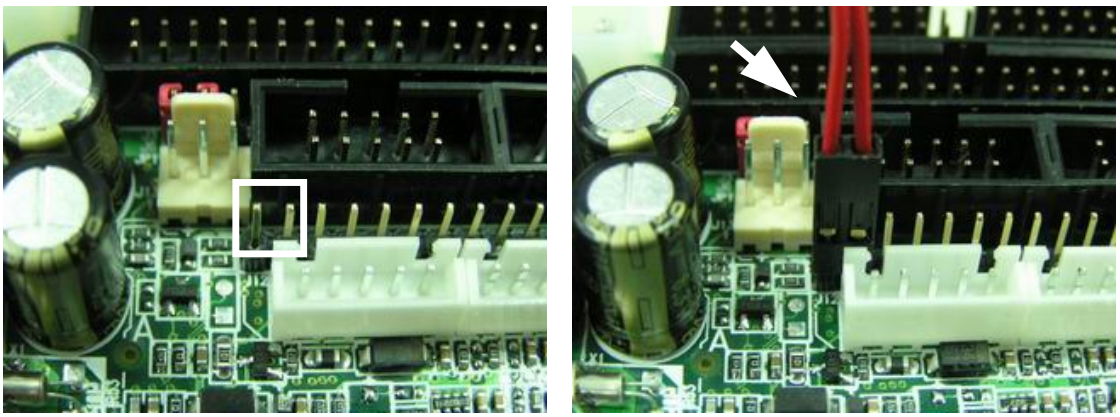


Figure 5-5

Step 6: The figure below is the TOGGLE SWITCH, which is used to switch the ATX Power on/off for SBC. Usually the TOGGLE SWITCH is located on the chassis front panel. Pressing the switch button once will turn power on, and press again to turn it off. (Figure 5-6)

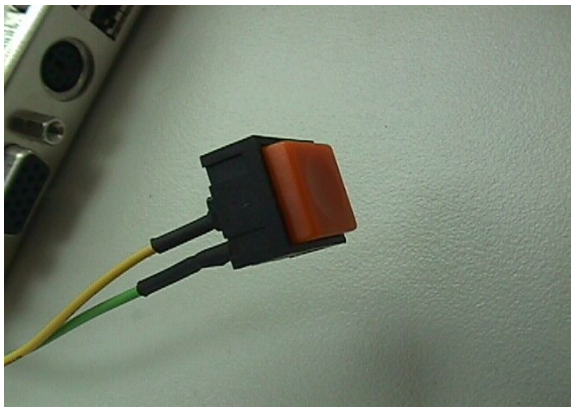


Figure 5-6

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AT Power Setting

This section will introduce you how to quickly and appropriately set up AT power on your system.

Step 1: If you were currently using ATX mode, please remove 4 pins power cable, and then put a jumper back on pin 3 (PS-ON) and pin 4 (GND) of Backplane ATX P/S control connector. (Figure 5-7)

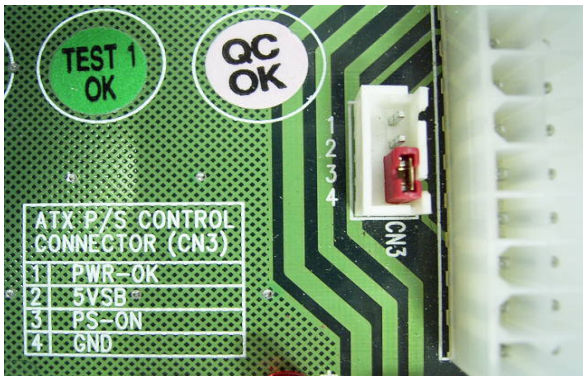


Figure 5-7

Step 2: Please adjust AT/ATX Jumper on JP3 to short 1-3, 2-4 pins, then it can support AT power scheme. (Figure 5-8)

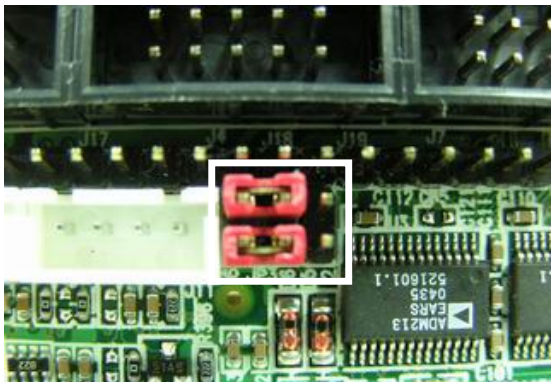


Figure 5-8

Step 3: Turn on the Power Supply, then system will boot up. Generally, when using AT mode Power Supply, there will be a power button connect to the front panel.

Note: If you currently used ATX mode, please clean CMOS first before adjusting Power setting to AT mode. Otherwise, system might not boot up properly.

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Stand-alone Setting

The purpose of system stand-alone function is to identify the root cause by isolating the board from other possible system devices such as PCI device, Backplane, and so on. Please refer the following steps to make system at stand-alone status.

Please check Power Consumption of processors, because the wires of 4-pin peripheral power connector might not withstand too much current on the 5V loading!

Step 1: Please connect 4 pins IDE power connector to J2 in order to make system stand-alone (See Figure 5-9)

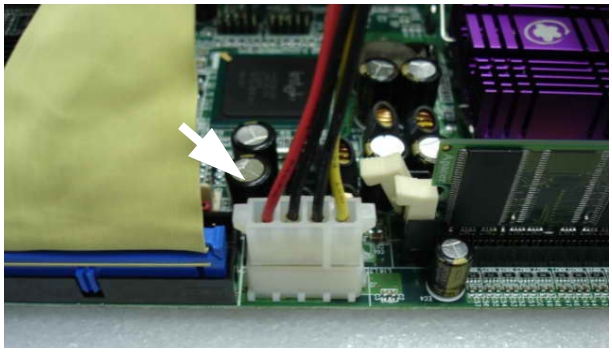


Figure 5-9

Step 2: Please connect 12V Power connector to CPU supplementary Power Connector (J1), which shows on Figure 5-1.

Step 3: If you are using ATX power, please short PS-ON and Ground on ATX power connector (As Figure 5-10), and turn on AC power switch of ATX power supply to let system boot up. If you are using AT power supply, you can simply turn on the power on AT power supply to boot up the system.

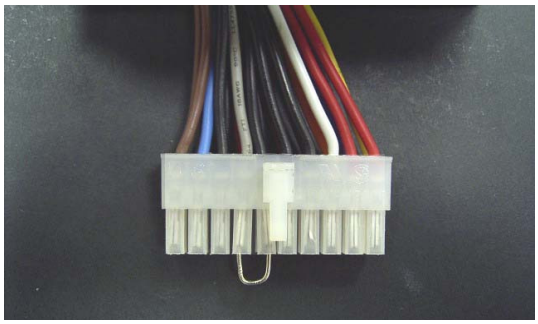


Figure 5-10

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Note:
Due to the fact of different Power Supply Units had different definition on pin assignments. Therefore, please check Pin assignment on Power Supply or ask your vendor.

Unboot problem

Symptom: After changing power mode from ATX to AT, my system is just not working.

Solution: Due to ICH4 design, when you change your power mode from ATX to AT or from AT to ATX, you have to clean your CMOS in order to make your system boot up properly. To clean CMOS, please short 2-3 pins on JP1 for a moment, and then change it back to its default setting.

Symptom:SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Symptom: There is neither no beeps nor screen output.

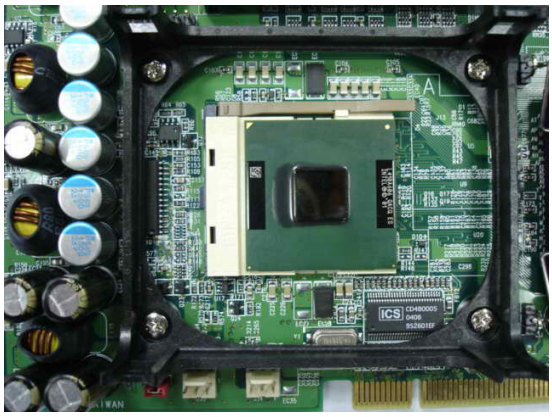
Solution: Indeed, you might want to check the system with the stand-alone to identify the root cause by isolating the board from other possible system devices such as PCI device, Backplane, and so on. If the system still cannot boot up, please fill out RMA form which is provides on Portwell website, and then send back to Portwell Inc. as a RMA goods. Besides, you also visit RMA site (http://www.portwell.com.tw/rma/login.asp) to check RMA report if necessary.

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5.2 Frequency Asking Questions

Q: Why the system could not work with Mobile Intel Pentium 4 processor?

A: There is a jumper setting of the "J32", which near the CPU Heat-sink holder on the bottom of the system board. Please check the Jumper Setting for J32. Please short the jumper J32 to enable the Mobile Pentium 4 MPM Support. After changed the CPU, please clear the CMOS setting by the "JP1" jumper to reset the BIOS setting for CPU detection.





To short this jumper setting is required for both Mobile Intel® Celeron® M Processor, and Mobile Intel® Pentium® 4 Processor. Please check and make sure this jumper setting when use the Mobile Intel® Celeron® M Processor, or Mobile Intel® Pentium® 4 Processor.

On the contrary, please leave the jumper "J32" open for using the Intel Pentium 4 Processor with Hyper-Threading Technology, and Intel Pentium 4/ Celeron Processor.

Q: Why the system had rapid alarm sound with DDR266 SDRAM Memory installed?

A: Please notify. When using Pentium 4 Processor with Hyper-Threading Technology FSB 800 MHz processor, then must using 400MHz DDR SDRAM.

Basically, the board can detect the memory clock frequency automatically. To match with the CPU PSB BUS frequency, the board will down grade the memory clock frequency to meet the CPU PSB BUS frequency. But it cannot up grade for over-clocking.

Also, Please check the "Clock Latency" value of the DDR DIMM. Please check the "Clock Latency" value to meet the specification of the DDR DIMM in the BIOS setting.

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For example, when using the DDR333MHz SDRAM Memory with FSB400MHz CPU, the board will down grade the memory clock frequency to DDR200MHz.

Q: In addition to the above description, is there anything to do to finish up an ATX system?

A: Yes. ROBO-8712E needs to be configured to support ATX function for the above cabling. Please move jumper JP3 to 3-5 short and 4-6 short (support ATX function).

Q: How can I build up an AT system using ATX power supply

A: Do not forget to move JP3 of ROBO-8712E back to 1-3 short and 2-4 short (support AT function).

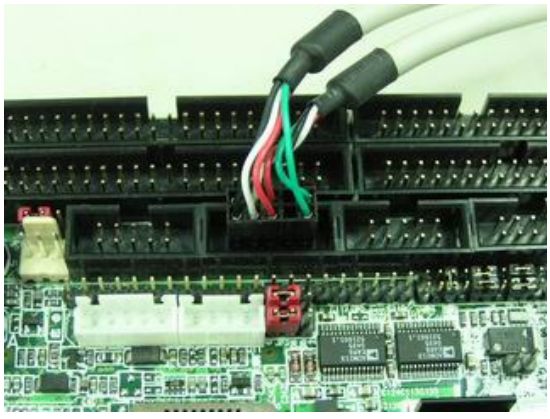
If the ATX power supply has a switch, such as ORION-330ATX-12V, do not remove the jumper of Backplane connector in step 1, and use the power supply switch as the system power on switch.

In all cases, users may apply a 2-pin AT (on/off) switch over pin-3 and pin-4 of the Backplane connector in step 1. However, power supply switch needs to be moved to "on", if there is one.

Q: How to use Standard PS/2 Keyboard and Mouse?

A: Users may always adopt the USB Keyboard/Mouse though the USB ports on the back bracket.

Also, Users may adopt PS/2 keyboard and mouse over the J4 connector interface on ROBO-8712E. The PS/2 extension cable is the optional device for the ROBO-8712E, which is only made for ROBO-8712EVG2A.



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However, it is also fine to adopt a standard keyboard over the standard keyboard connector on Backplane, if provided. In this way, users need to adopt a 5-pin keyboard connection cable to line-up, external keyboard interface, J12 on ROBO-8712E with the 5-pin keyboard connector on Backplane.

Q: OK. I have finished up hardware installation, but I got nothing when I power on the system. Why?

A: There are thousands of different reasons to get this power on failure.

1. Check ROBO-8712E jumper, JP3. For AT power supply or ATX power supply used for AT system, JP3 needs to be at 1-3 and 2-4. Otherwise, it needs to be at 3-5 and 4-6 for ATX mode. Incorrect power setting will not allow you to power on the system.
2. Double check if every connector is attached with the correct cable.
3. If you have changed processor with different system clock, please move JP1 (CMOS clear Jumper) to 2-3, power on the system to clear CMOS (move on/off switch from off to on for AT mode, or toggle the switch for ATX mode), power off the system, move JP1 back to 1-2, and power on again. This way to process the action for "Clear the CMOS Setting".

Q: I connect two IDE devices over one IDE flat cable, but the system either does not start, or just hangs from time to time. Why?

A: Make sure that you have configured the two IDE devices as a master and a slave, respectively.

Q: I am using an ATA-66 (or 100) hard drive, how can I know that ATA-66 function is started??

A: You need to use the 80-pin ATA-66 IDE flat cable to have this function ready. During POST, you can see ATA-66 (or 100) message while hard drive is being detected. Besides, after Microsoft series OS installation successfully, you must install ATA-66/100 driver, then the function can be active.

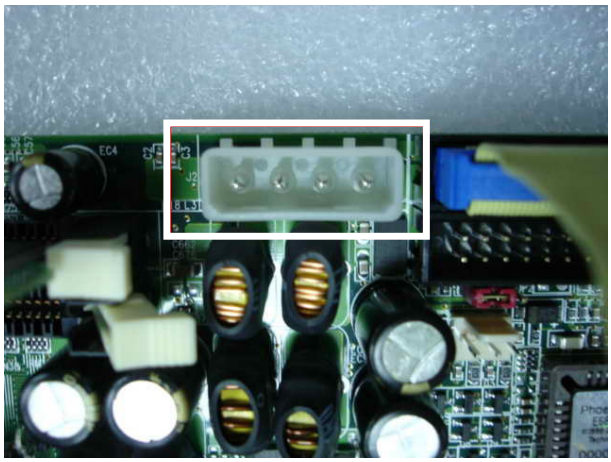
Q: After inserting Compact-Flash, why doesn't it work at all?

A: Compact-Flash is occupied with the master device of IDE Secondary channel. If there is any device occupying this Secondary IDE Master channel, please remove it or set it as a slave device.

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Q: When I try to boot from Removable USB HDD device, why is it not working?

A: Please first adjust the BIOS setting of "First Boot Device" to "USB-HDD"(USB-Floppy Drive, USB-CDROM, etc.). Also, Please connected the 4Pin IDE power connector of "J2" for extra support of 5V power input. In additional, some USB devices will need more power input on the 5V current.



"J2" 4Pin IDE power connector

Q: How can I use the SCSI interface for boot device?

A: You need to plug the add-on SCSI card and SCSI HDD properly, and connect the SCSI flat cable with Terminator to the SCSI HDD, which to have this function ready. When you are using the SCSI devices, please connect the SCSI Flat cable with Terminator to the SCSI HDD. When system boot-up; the system will initialize the SCSI Utility to detect the HDD. Use the SCSI Utility to configure the HDD setting.

In the BIOS setting, please set the "First Boot Device" as from the "SCSI". During POST, you can see the message while the SCSI Utility is running and the SCSI HDD is being detected.

Besides, when install the Microsoft series OS; please click "F6" hotkey to Install the SCSI driver from the beginning. You must install the SCSI driver properly, and then the function can fully active.

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5.3 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the device cables required before turning on AT power. CPU, CPU fan, CPU fan power cable, 184-pin DDR SDRAM, keyboard, mouse, floppy drive, IDE hard disk, printer, VGA connector, device power cables, ATX accessories or 12V 4-pin power cable are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with ROBO-8712E, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and pressed "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the floppy drive, COM1/COM2 ports, parallel port, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are:

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disable COM1 serial port to release IRQ #4
disable COM2 serial port to release IRQ #3
disable parallel port to release IRQ #7
disable PS/2 mouse to release IRQ #12,
…, etc.

Interrupt Request Lines (IRQ)

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Counter
IRQ #1	Keyboard
IRQ #2	Programmed Controller
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Display Controller (Shareable)
IRQ #5	USB 1.0/1.1 UHCI Controller (Shareable)
IRQ #6	Floppy Disk Controller
IRQ #7	Print Port (Parallel Port)
IRQ #8	CMOS Clock
IRQ #9	ACPI Controller (Shareable)
IRQ #9	SM BUS Controller (Shareable)
IRQ #9	Multimedia Device (Shareable)
IRQ #10	USB 1.1 UHCI Controller (Shareable)
IRQ #10	Ethernet Controller (Shareable)
IRQ #11	Ethernet Controller (Shareable)
IRQ #11	USB 2.0 EHCI Controller (Shareable)
IRQ #12	PS/2 mouse
IRQ #13	Data Processor
IRQ #14	Primary IDE Controller
IRQ #15	Secondary IDE Controller

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers. The IRQ list will show on the Post sequences as system hardware checking.

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System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used.

Memory Area	Size	Device Description
0000 – 003F	1K	Interrupt Area
0040 – 004F	0.3K	BIOS Data Area
0050 – 006F	0.5K	System Data
0070 – 0483	16K	DOS
0484 – 085B	15K	Program Area
085C – 9F7F	604K	[Available]
9F7F –9FFF	2K	Unused
= Conventional memory ends at 638K =		
A000 – AFFF	64K	VGA Graphics
B000 – B7FF	32K	Unused
B800 – BFFF	32K	VGA Text
C000 – CB3F	45K	Video ROM
CB40 – D549	40K	Unused
D54A – DFFF	42K	High RAM
E000 – EFFF	64K	Unused
F000 – FFFF	64K	System ROM
HMA	64K	First 64K Extended

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Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	SMARTDRV	System Timer
IRQ 1	SMARTDRV	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM 2
IRQ 4	System ROM	COM 1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ

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