NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (Industrial Motherboard)

NEX 880/890

User Manual

NEXCOM International Co., Ltd.
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Contents

Preface

Copyright iv
Disclaimer iv
Acknowledgements iv
Regulatory Compliance Statements iv
Declaration of Conformity iv
RoHS Compliance v
Warranty and RMA vi
Safety Information vii
Installation Recommendations vii
Safety Precautions viii
Technical Support and Assistance ix
Conventions Used in this Manual ix
Global Service Contact Information x
Package Contents xii
Ordering Information xiii

Chapter 1: Product Introduction

Overview 1
  Key Features 1
Hardware Specifications 2
Getting to Know NEX 880/890 4

Chapter 2: Jumpers and Connectors

Before You Begin 5
Precautions 5
Jumper Settings 6
Locations of the Jumpers and Connectors 7
Jumpers 8
  CMOS Clear Select 8
  ME Clear Select 8
  BIOS CS# SEL Select 9
Connectors Pin Definitions 10
  External I/O Interface 10
    PS/2 Keyboard and PS/2 Mouse Ports 10
    COM1 and COM2 Ports (RS232) 10
    VGA and DVI-D Ports 11
    LAN1 and USB0/1 Ports 12
    LAN2 and USB2/3 Ports 12
    Audio Jacks 13
  Internal Connectors 14
    SATA 3.0 Ports 14
    SATA 2.0 Ports 14
    USB Connectors 15
    FP Audio Connector 15
    FP Control Connector 16
    ATX Power Connector 16
    ATX Power Connector 17

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SMBus Connector 17
GPIO Connector 18
Port 80 Debug Connector 18
CPU Fan Connector 19
System Fan Connectors 19
PCIe x16 Slot 20
PCIe x8 Slot 21
PCIe x4 Slot 22

Chapter 3: BIOS Setup

About BIOS Setup 23
When to Configure the BIOS 23
Entering Setup 24
Legends 24
BIOS Setup Utility 25
Main 25
Advanced 26
Chipset 37
Boot 41
Security 42
Save & Exit 43

Appendix A: Watchdog Timer

WDT Programming Guide 44

Appendix B: GPI/O Programming Guide

GPIO Programming Sample Code 45

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PREFACE

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Acknowledgements

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

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Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

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Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect the equipment from an AC power outlet prior to installing a component inside the chassis.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. Keep the board away from humidity.
6. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
7. Do not leave the board in either an unconditioned environment or in a above 60°C storage temperature as this may damage the board.
8. Wear an antistatic wrist strap.
9. Do all preparation work on a static-free surface.
10. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
11. All cautions and warnings on the board should be noted.
12. Use the correct mounting screws and do not over tighten the screws.
13. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

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Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Conventions Used in this Manual

Warning: Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution: Information to avoid damaging components or losing data.

Note: Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the NEX 880/890 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	50222A0468X00	NEX880 I/O PANEL VER:A NORTHERN QUEEN	158.75x44.45x4.40mm SUS t=0.2mm	1
2	60233ATA17X00	SATA CABLE BEST:148-0707-300R	Standard L:300mm	1

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Ordering Information

The following provides ordering information for NEX 880 and NEX 890.

- **NEX 880 (P/N : 10G00088000X0) RoHS Compliant**
  microATX, LGA1155, 2nd generation Intel® Core™ Desktop processors, Q67, DDR3 DIMM x4, VGA, DVI-D, 2x GbE, PCIe x8, PCIe x4, 2x PCIe x1, 2x RS232
- **NEX 890 (P/N : 10G00089000X0) RoHS Compliant**
  microATX, LGA1155, 2nd generation Intel® Core™ Workstation processors, C206, DDR3 DIMM x4, VGA, DVI-D, 2x GbE, PCIe x8, PCIe x4, 2x PCIe x1, 2x RS232

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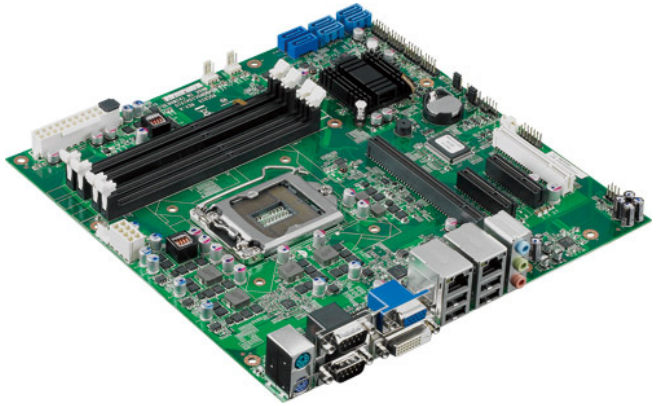
Chapter 1: Product Introduction

Overview



Key Features

- 2nd generation Intel® Core™ Desktop processors (NEX 880)
  2nd generation Intel® Core™ Workstation processors (NEX 890)
- 4x DDR3 DIMM up to 32GB (NEX 890 supports ECC)
- Dual display: VGA and DVI
- 2x Intel® Gigabit Ethernet LAN
- Supports Intel® AMT 7.0
- SATA 3.0
- 2x RS232
- NEX 880
  1x PCIe x16 (with PCIe x8 signals), 1x PCIe x8 (with PCIe x1 signals), 1x PCIe x4, 1x PCIe x4 (with PCIe x1 signals)
- NEX 890
  1x PCIe x16 (with PCIe x8 signals), 1x PCIe x8, 2x PCIe x4

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Hardware Specifications

CPU
- LGA 1155, 2nd generation Intel® Core™ Desktop processors (NEX 880)
  LGA 1155, 2nd generation Intel® Core™ Workstation processors (NEX 890)

Chipset
- Intel® Q67 Platform Controller Hub (NEX 880)
  Intel® C206 Platform Controller Hub (NEX 890)

Main Memory
- 4x 240-pin DDR3 DIMM sockets
- Supports up to 32GB 1066/1333 dual channel DIMM
- Supports non-ECC unbuffered DIMM (NEX 880)
  Supports ECC DIMM (NEX 890)

Onboard LAN
- 1x Intel® 82579LM PHY for AMT 7.0
- 1x Intel® 82583 PCI Express Gigabit Ethernet
- Supports boot from LAN (PXE)
- 2x RJ45 with LED

Display
- 2nd generation Intel® Core™ Desktop processors
- Integrated HD graphics
- 1x VGA
- 1x DVI-D

Expansion
- NEX 880
  1x PCIe x16 (with PCIe x8 signals) slot
  1x PCIe x8 (with PCIe x1 signals) slot
  1x PCIe x4 (with PCIe x1 signals) slot
  1x PCIe x4 with PCIe x4 signals) slot
- NEX 890
  1x PCIe x16 (with PCIe x8 signals) slot
  1x PCIe x8 slot
  2x PCIe x4 slots

Edge I/O Interfaces
- 1x dual stack mini DIN 6-pin connector for PS2 KB/MS
- 1x dual stack DB9 male connector for COM1 & COM2
- 1x DVI + DB15 female connector for VGA
- 2x RJ45 with dual stack USB connectors
- Line-In/Line-Out/Mic phone jack

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I/O Interfaces
- USB 2.0: 10 ports (6 onboard pin headers, 4 with type A connector for external)
- Serial port: 2 ports, with 2x5 pin headers (COM 1 and COM 2)
- SATA HDD: 6 ports, port 1, 2 support SATA 3.0, port 3, 4, 5, 6 support SATA 2.0
- Supports RAID 0/1/5/10 and Intel® Matrix Storage
- IrDA: onboard pin header
- GPIO: Supports 4 sets general purpose I/O each with TTL level (5 V) interface
- 1x onboard buzzer
- Power LED/Power On/Reset/HDD LED pin header
- 1x 4-pin fan connector (for CPU); 2x 3-pin fan connectors (for System)
- On-chip RTC with battery backup
- 1x External Li-Ion battery

BIOS
- AMI BIOS
- Plug and play support

System Monitor
- 4 Voltages (+3.3V, +5V, +12V, Vcore)
- 2 Temperatures (For CPU and System)
- 3 FAN speed monitors (1 for CPU and 2 for System FAN)

Power Input
- Supports ATX power supply
- Standard ATX 24-pin connector for +12V/ +5V/ +3.3V/ +5Vsb/ -12V
- ATX 8-pin connector for +12V

Dimensions
- microATX
- 244mm (L) x 244mm (W)

Environment
- Board level operating temperatures: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: 10% to 90%, (Non-condensing)

Certifications
- CE approval
- FCC Class A

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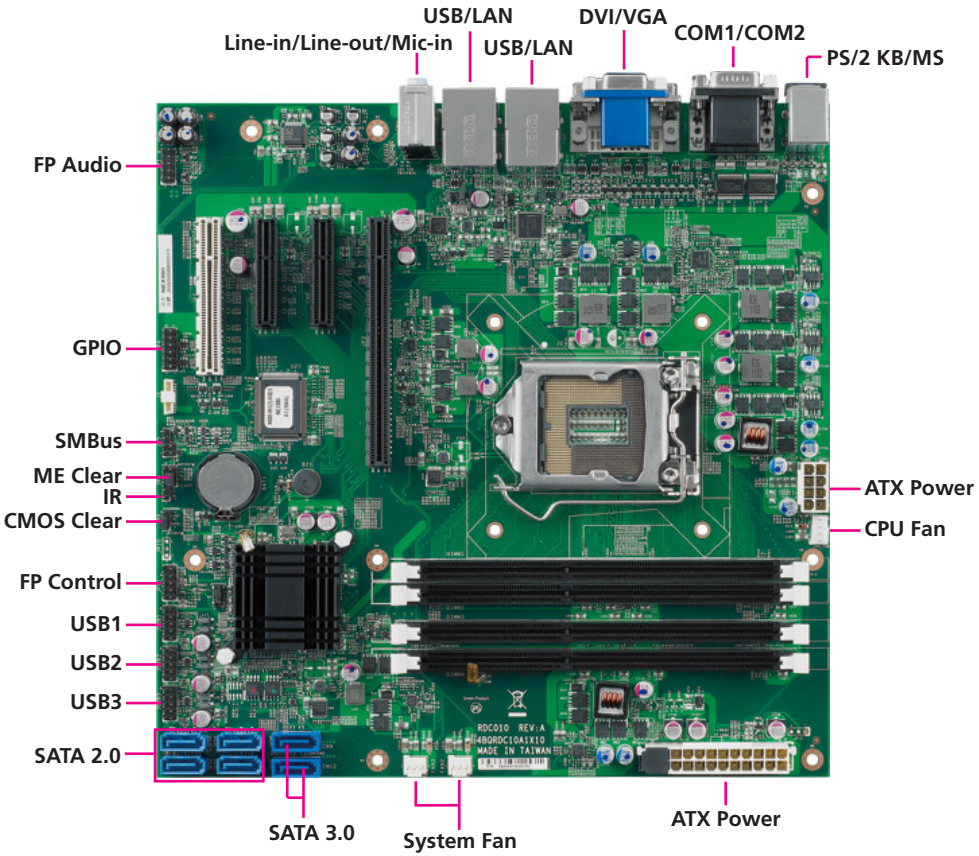
Getting to Know NEX 880/890



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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NEX 880/890 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers Screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

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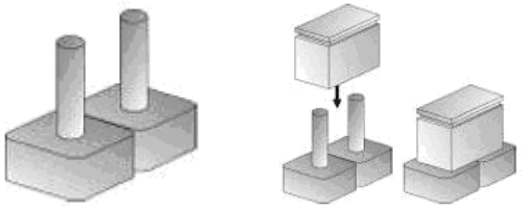
Jumper Settings

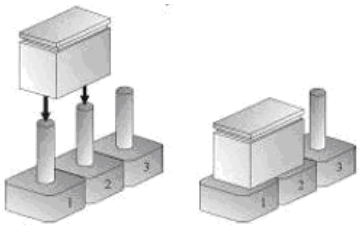
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **open**.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



Three-Pin Jumpers: Pins 1 and 2 Are Short



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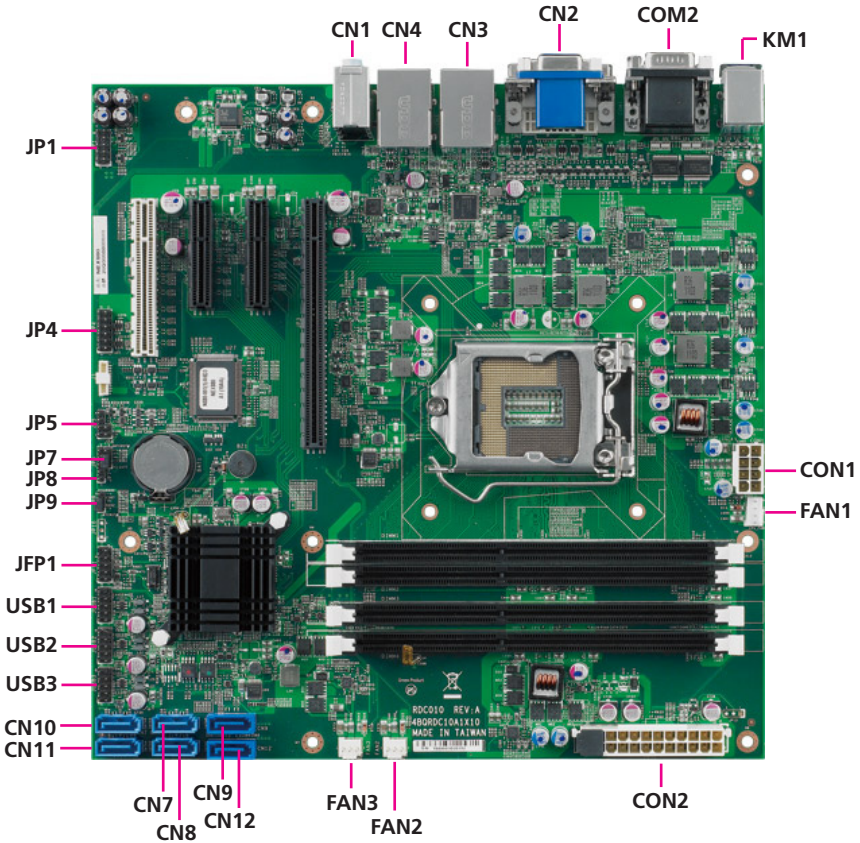
Locations of the Jumpers and Connectors

The figure below shows the locations of the jumpers and connectors.



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Jumpers

CMOS Clear Select

Connector type: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP9

Pin	Settings
1-2 On	Normal
2-3 On	Clear BIOS

1-2 On: default

Pin	Definition
1	NA
2	VCC3P3RTC
3	BATT_GND

ME Clear Select

Connector type: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP7

Pin	Settings
1-2 On	Normal
2-3 On	Clear ME

1-2 On: default

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BIOS CS# SEL Select

Connector type: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP10

Pin	Settings
1-2 On	ME ROM
2-3 On	BIOS ROM

1-2 On: default

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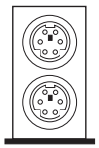
Connector Pin Definitions

External I/O Interfaces

PS/2 Keyboard and PS/2 Mouse Ports

Connector type: PS/2, Mini-DIN-6
Connector location: KM1



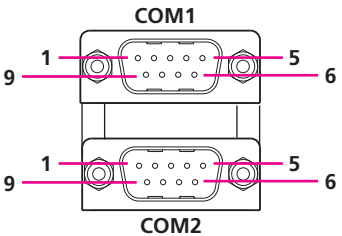
PS/2 Mouse

PS/2 Keyboard

Pin	Definition	Pin	Definition
1	Keyboard Data	7	Mouse Data
2	NC	8	NC
3	GND	9	GND
4	+5VSB	10	+5VSB
5	Keyboard Clock	11	Mouse Clock
6	NC	12	NC

COM1 and COM2 Ports (RS232)

Connector type: DB-9 port, 9-pin D-Sub
Connector location: COM2



Pin	Definition	Pin	Definition
1	DCD1	10	DCD2
2	RXD1	11	RXD2
3	TXD1	12	TXD2
4	DTR1	13	DTR2
5	GND	14	GND
6	DSR1	15	DSR2
7	RTS1	16	RTS2
8	CTS1	17	CTS2
9	RI1	18	RI2

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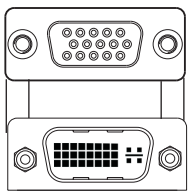
VGA and DVI-D Ports

Connector type: DB-15 port, 15-pin D-Sub (VGA)
24-pin D-Sub, 2.0mm-M-180 (DVI)
Connector location: CN2

VGA



DVI

Pin	Definition	Pin	Definition	Pin	Definition
01	DVI_DATA2_N	02	DVI_DATA2_P	03	GND
04	NC	05	NC	06	DVI_CTRL_CLK
07	DVI_CTRL_DATA	08	NC	09	DVI_DATA1_N
10	DVI_DATA1_P	11	GND	12	NC
13	NC	14	VCC5	15	GND
16	DVI_HPDET	17	DVI_DATA0_N	18	DVI_DATA0_P
19	GND	20	NC	21	NC
22	NC	23	DVI_CLK_P	24	DVI_CLK_N
25	RED_VGA	26	GREEN_VGA	27	BLUE_VGA
28	GND	29	GND	30	GND
31	GND	32	GND	33	VCC5
34	GND	35	GND	36	DDC_DATA_V
37	HS_VGA	38	VS_VGA	39	CLK_V

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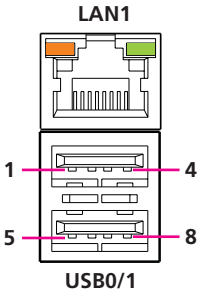
LAN1 and USB0/1 Ports

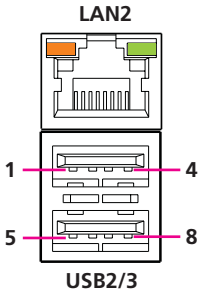
Connector type: RJ45 port with LEDs (LAN1)
Dual USB port, Type A (USB0/1)
Connector location: CN3



Pin	Definition	Pin	Definition
1	5VDUAL	2	USB0_N
3	USB0_P	4	GND
5	5VDUAL	6	USB1_N
7	USB1_P	8	GND
9	TCT	10	LAN1_MDI0P
11	LAN1_MDI0N	12	LAN1_MDI1P
13	LAN1_MDI1N	14	LAN1_MDI2P
15	LAN1_MDI2N	16	LAN1_MDI3P
17	LAN1_MDI3N	18	GND
19	LAN1_100M#	20	LAN1_1G#
21	LAN1_ACTLED#	22	LAN1_ACTLED# POWER

LAN2 and USB2/3 Ports

Connector type: RJ45 port with LEDs (LAN2)
Dual USB port, Type A (USB2/3)
Connector location: CN4



Pin	Definition	Pin	Definition
1	5VDUAL	2	USB2_N
3	USB2_P	4	GND
5	5VDUAL	6	USB3_N
7	USB3_P	8	GND
9	TCT	10	LAN2_MDI0P
11	LAN2_MDI0N	12	LAN2_MDI1P
13	LAN2_MDI1N	14	LAN2_MDI2P
15	LAN2_MDI2N	16	LAN2_MDI3P
17	LAN2_MDI3N	18	GND
19	LAN2_100M#	20	LAN2_1G#
21	LAN2_ACTLED#	22	LAN2_ACTLED# POWER

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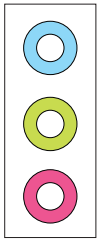
Audio Jacks

Connector type: 1x3 Ear Phone jack
Connector location: CN1



Pin	Definition	Pin	Definition
1	GND	24	GND
2	MIC1_L	25	FRONT_R
3	MIC1_JD	32	LINEIN_L
4	GND	33	LINEIN_JD
5	MIC1_R	34	GND
22	FRONT_L	35	LINEIN_R
23	FRONT_JD		

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Internal Connectors

SATA 3.0 Ports

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: CN9 (SATA0), CN12 (SATA1)

Pin	Definition
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_P
6	SATA_RX_N
7	GND

SATA 2.0 Ports

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: CN11 (SATA2), CN8 (SATA3), CN10 (SATA4), CN7 (SATA5)

Pin	Definition
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_P
6	SATA_RX_N
7	GND

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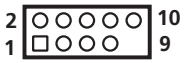
USB Connectors

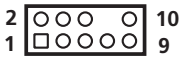
Connector type: 2x5 10-pin header, 2.54mm
Connector location: JUSB1 (USB10, USB11), JUSB2 (USB8, USB9), JUSB3 (USB4, USB5)



Pin	Definition	Pin	Definition
1	5VDUAL	2	5VDUAL
3	DATA0_N	4	DATA1_N
5	DATA1_P	6	DATA1_P
7	GND	8	GND
9	KEY	10	NC

FP Audio Connector

Connector type: 2x5 10-pin header, 2.54mm
Connector location: JP1



Pin	Definition	Pin	Definition
1	MIC2_L	2	GND
3	MIC2_R	4	FP_AUD_DETECT
5	LINE2_R	6	MIC2_JD
7	GND	8	
9	LINE2_L	10	LINE2_JD

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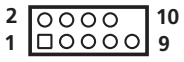
FP Control Connector

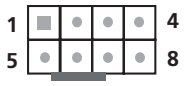
Connector type: 2x5 10-pin header, 2.54mm
Connector location: JFP1



Pin	Definition	Pin	Definition
1	SATA_LED_P	2	PWR_LED_P
3	SATA_LED_N	4	GND
5	GND	6	PWRBT_N
7	RST_BTN_N	8	GND
9	NC		

ATX Power Connector

Connector type: 2x4 8-pin connector
Connector location: CON1



Pin	Definition	Pin	Definition
1	GND	5	VCC12
2	GND	6	VCC12
3	GND	7	VCC12
4	GND	8	VCC12

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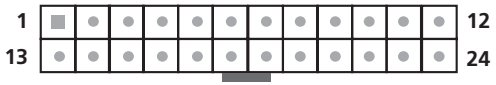
ATX Power Connector

Connector type: 2x12 24-pin connector
Connector location: CON2



Pin	Definition	Pin	Definition
1	VCC3	13	VCC3
2	VCC3	14	NC
3	GND	15	GND
4	VCC5	16	PS-ON
5	GND	17	GND
6	VCC5	18	GND
7	GND	19	GND
8	POWEROK	20	NC
9	5VSB	21	VCC5
10	VCC12	22	VCC5
11	VCC12	23	VCC5
12	VCC3	24	GND

SMBus Connector

Connector type: 1x4 4-pin header, 2.54 mm pitch
Connector location: JP5

Pin	Definition
1	3VSB
2	SMB_DATA
3	SMB_CLK
4	GND

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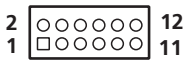
GPIO Connector

Connector type: 2x6 12-pin header, 2.0 mm pitch
Connector location: JP4



Pin	Definition	Pin	Definition
1	GPI1	2	GPO1
3	GPI2	4	GPO2
5	GPI3	6	GPO3
7	GPI4	8	GPO4
9	VCC3	10	VCC3
11	GND	12	GND

Port 80 Debug Connector

Connector size: JST 1x10 10-pin, 2.54 mm pitch
Connector location: J1

Pin	Definition	Pin	Definition
1	GND	2	LRST
3	LPC_CLK	4	LFRAME#
5	LAD3	6	LAD2
7	LAD1	8	LAD0
9	3VSB	10	3VSB

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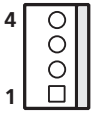
CPU Fan Connector

Connector type: 1x4, 4-pin Wafer, 2.54 mm pitch
Connector location: FAN1



Pin	Definition
1	GND
2	VCC12
3	FAN_TAC1
4	FAN_CTL1

System Fan Connectors

Connector size: 1x3, 3-pin Wafer, 2.54 mm pitch
Connector location: Fan2, Fan3

Pin	Definition
1	GND
2	VCC12
3	FAN_TAC

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PCIe x16 Slot

Connector type: PCIe x16
Connector location: JP3

Pin	Definition	Definition	Pin	Definition	Definition
1	VCC12	NC	18	GND	GND
2	VCC12	VCC12	19	TXP1	RSV
3	VCC12	VCC12	20	TXN1	GND
4	GND	GND	21	GND	RXP1
5	SMB_CLK	NC	22	GND	RXN1
6	MB_DATA	NC	23	TXP2	GND
7	GND	NC	24	TXN2	GND
8	VCC3	NC	25	GND	RXP2
9	NC	VCC3	26	GND	RXN2
10	3VSB	VCC3	27	TXP3	GND
11	WAKE#	PERST#	28	TXN3	GND
12	RSV	GND	29	GND	RXP3
13	GND	REFCLK_P	30	RSV	RXN3
14	TXP0	REFCLK_N	31	PRSNT2#	GND
15	TXN0	GND	32	GND	RSV
16	GND	RXP0	33	TXP4	RSV
17	PRSNT2#	RXN0	34	TXN4	GND

Pin	Definition	Definition	Pin	Definition	Definition
35	GND	RXP4	59	NC	GND
36	GND	RXN4	60	GND	NC
37	TXP5	GND	61	GND	NC
38	TXN5	GND	62	NC	GND
39	GND	RXP5	63	NC	GND
40	GND	RXN5	64	GND	NC
41	TXP6	GND	65	GND	NC
42	TXN6	GND	66	NC	GND
43	GND	RXP6	67	NC	GND
44	GND	RXN6	68	GND	NC
45	TXP7	GND	69	GND	NC
46	TXN7	GND	70	NC	GND
47	GND	RXP7	71	NC	GND
48	PRSNT2#	RXN7	72	GND	NC
49	GND	GND	73	GND	NC
50	NC	RSV	74	NC	GND
51	NC	GND	75	NC	GND
52	GND	NC	76	GND	NC
53	GND	NC	77	GND	NC
54	NC	GND	78	NC	GND
55	NC	GND	79	NC	GND
56	GND	NC	80	GND	NC
57	GND	NC	81	PRSNT2#	NC
58	NC	GND	82	NC	GND

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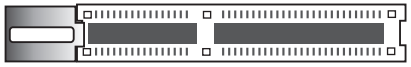
PCIe x8 Slot

Connector type: PCIe x8, PCH-PE3 for PCH Q67
Connector location: JP2



Pin	Definition	Definition	Pin	Definition	Definition
1	VCC12	NC	18	GND	GND
2	VCC12	VCC12	19	NC	RSV
3	VCC12	VCC12	20	NC	GND
4	GND	GND	21	GND	NC
5	SMB_CLK	NC	22	GND	NC
6	SMB_DATA	NC	23	NC	GND
7	GND	NC	24	NC	GND
8	VCC3	NC	25	GND	NC
9	NC	VCC3	26	GND	NC
10	3VSB	VCC3	27	NC	GND
11	WAKE#	PERST#	28	NC	GND
12	RSV	GND	29	GND	NC
13	GND	REFCLK_P	30	RSV	NC
14	TXP0	REFCLK_N	31	PRSNT2#	GND
15	TXN0	GND	32	GND	RSV
16	GND	RXP0	33	NC	RSV
17	PRSNT2#	RXN1	34	NC	GND

Pin	Definition	Definition	Pin	Definition	Definition
35	GND	NC	43	GND	NC
36	GND	NC	44	GND	NC
37	NC	GND	45	NC	GND
38	NC	GND	46	NC	GND
39	GND	NC	47	GND	NC
40	GND	NC	48	PRSNT2#	NC
41	NC	GND	49	GND	GND
42	NC	GND			

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PCIe x4 Slot

Connector type: PCIe x4
Connector location: CN6 (PE0-3)

Pin	Definition	Definition	Pin	Definition	Definition
1	VCC12	NC	17	PRSNT2#	RXN0
2	VCC12	VCC12	18	GND	GND
3	VCC12	VCC12	19	TXP1	RSV
4	GND	GND	20	TXN1	GND
5	SMB_CLK	NC	21	GND	RXP1
6	SMB_DATA	NC	22	GND	RXN1
7	GND	NC	23	TXP2	GND
8	VCC3	NC	24	TXN2	GND
9	NC	VCC3	25	GND	RXP2
10	3VSB	VCC3	26	GND	RXN2
11	WAKE#	PERST#	27	TXP3	GND
12	RSV	GND	28	TXN3	GND
13	GND	REFCLK_P	29	GND	RXP3
14	TXP0	REFCLK_N	30	RSV	RXN3
15	TXN0	GND	31	PRSNT2#	GND
16	GND	RXP0	32	GND	RSV

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Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for the NEX 880/890. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the Setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

This program should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

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Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

```
TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC>
Press the <Del> key to enter Setup:
```

Legends

Key	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between sub-menus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F10>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted sub-menu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

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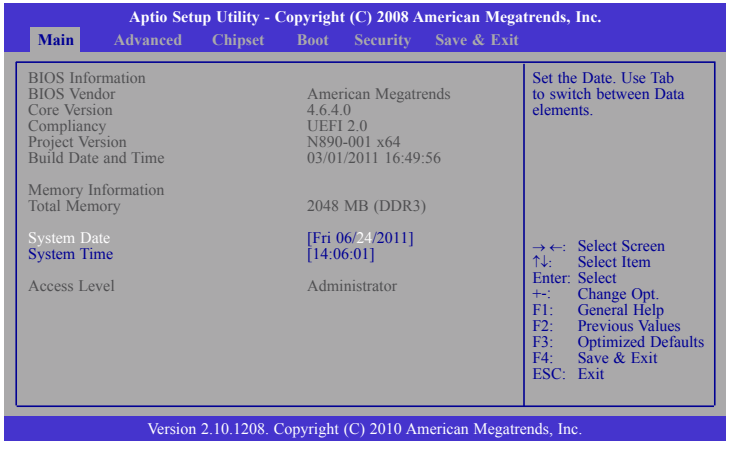
BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



BIOS Information

Displays the detected BIOS information.

Memory Information

Displays the detected system memory information.

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

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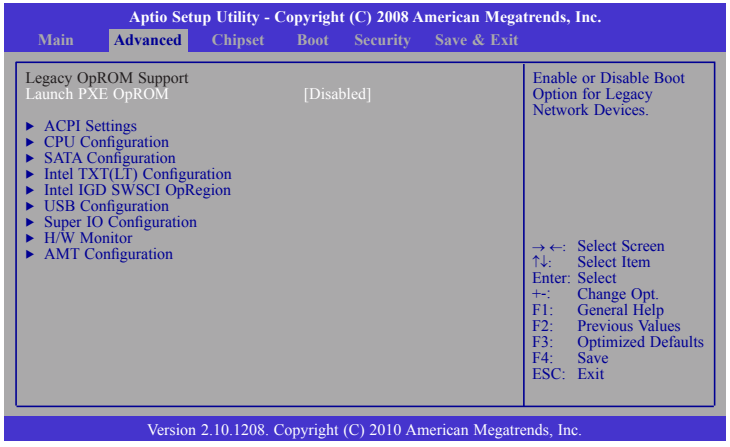
Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



Launch PXE OpROM

Enables or disables the boot option for legacy network devices.

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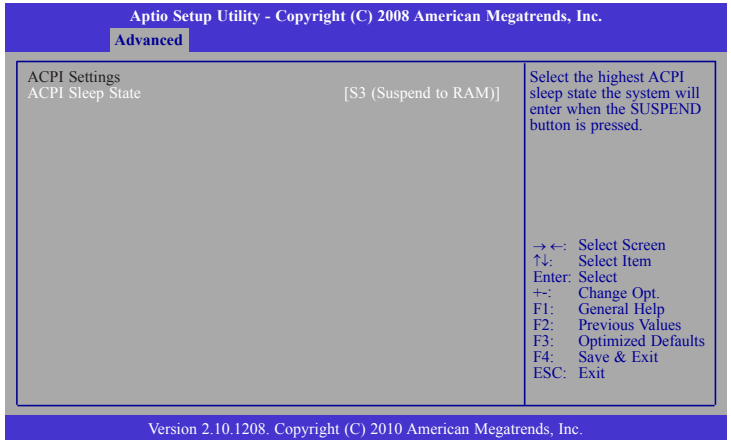
ACPI Settings

This section is used to configure the ACPI.



ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S1 (CPU Stop Clock)	Enables the Power On Suspend function.
S3 (Suspend to RAM)	Enables the Suspend to RAM function.

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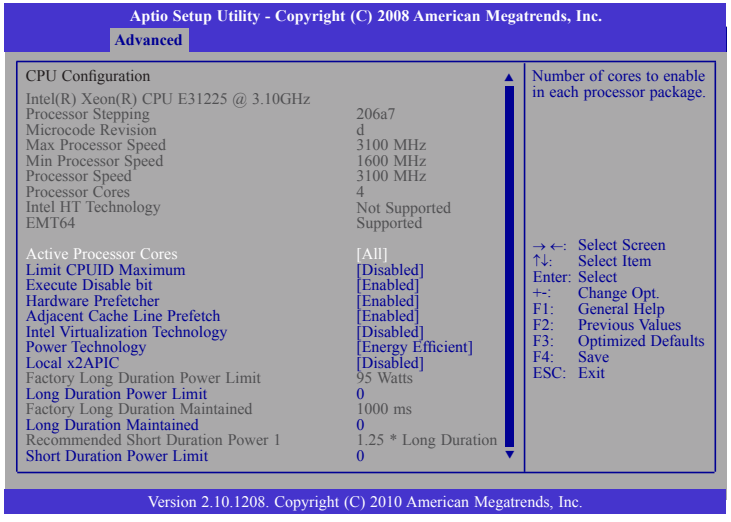
CPU Configuration

This section is used to configure the CPU.



CPU Configuration

Displays the detected CPU information.

Active Processor Cores

This field is used to enter the number of cores to enable in each processor package.

Limit CPUID Maximum

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0. XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

Hardware Prefetcher

Tuns on or off the Mid level Cache (L2) streamer prefetcher. The options are Enabled and Disabled.

Adjacent Cache Line Prefetch

Turns on or off prefetching of adjacent cache lines. The options are Enabled and Disabled.

Intel Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Power Technology

Configures the power management features.

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Local x2APIC

Enables or disables the Local x2APIC. Some OSes doesn't support this feature.

Long Duration Power Limit

Configures the long duration power limit in Watts.

Long Duration Maintained

Time window when the long duration power is maintained.

Short Duration Power Limit

Configures the short duration power limit in Watts.

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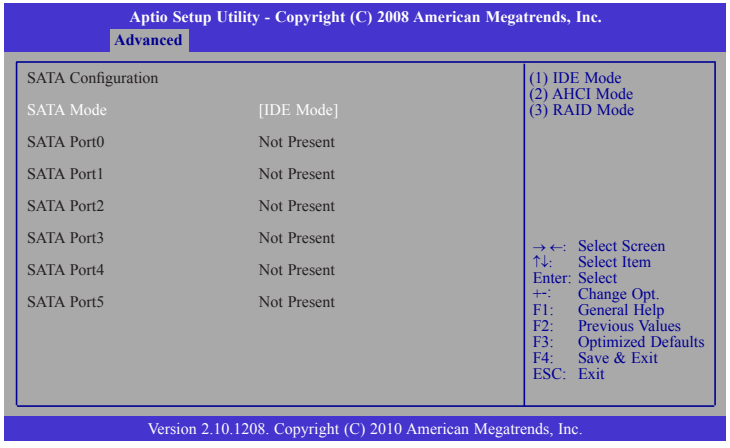
SATA Configuration

This section is used to configure SATA.



SATA Mode

IDE Mode This option configures the Serial ATA drives in IDE mode.
RAID Mode This option enables the RAID function for Serial ATA drives.
AHCI Mode This option configures the Serial ATA drives in AHCI mode.

Serial-ATA Controller 0 / Serial-ATA Controller 1

Configures the Serial ATA controller to Compatible or Enhanced mode.

eSATA Port Support

Enables or disables the eSATA port.

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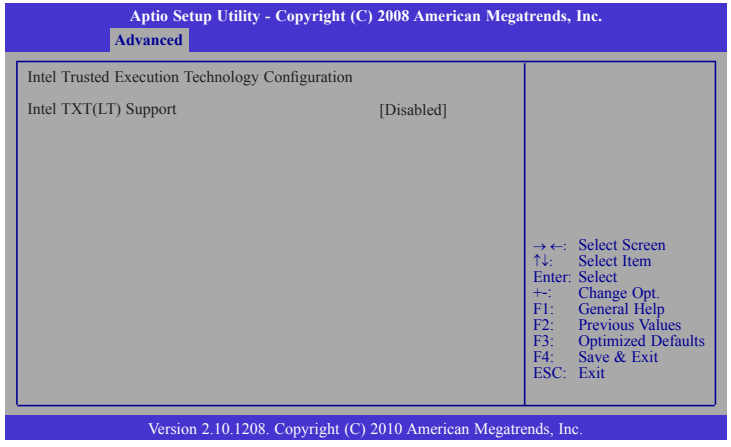
Intel TXT(LT) Configuration

This section is used to configure the Intel TXT(LT).

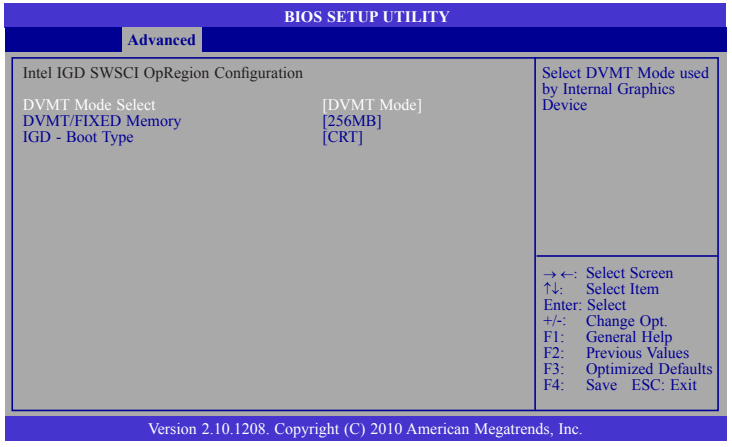


Intel TXT(LT) Support

The options are Enabled and Disabled.

Intel IGD SWSCI OpRegion

This section is used to configure the Intel graphics display.



DVMT Mode Select

Selects the DVMT mode used by the internal graphics device.

DVMT/FIXED Memory

Selects the DVMT/FIXED mode memory size used by the internal graphics device.

IGD - Boot Type

Selects the video device that will be activated during POST. This will not affect any external graphics that may be present.

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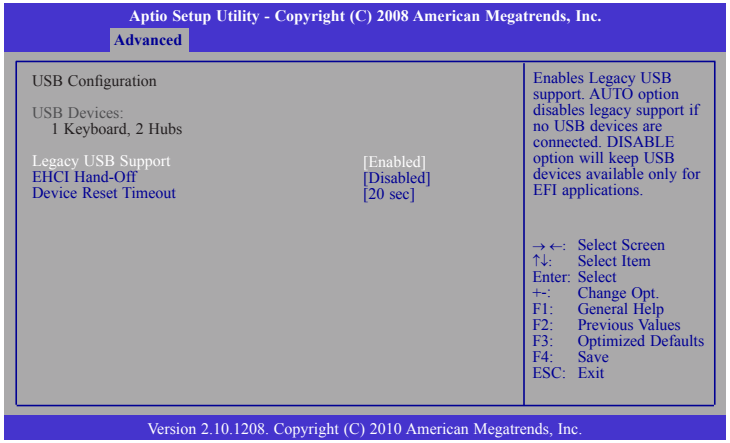
USB Configuration

This section is used to configure the USB.



USB Configuration

Displays the detected USB devices.

Legacy USB Support

Enable Enables Legacy USB.
Auto Disables support for Legacy when no USB devices are connected.
Disable Keeps USB devices available only for EFI applications.

EHCI Hand-Off

This is a workaround for OSes that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

Device Reset Timeout

Selects the USB mass storage device's start unit command timeout.

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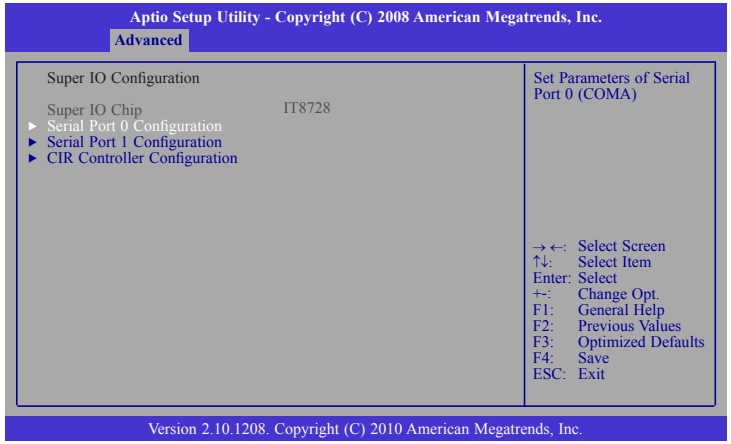
Super IO Configuration

This section is used to configure the serial and parallel ports.

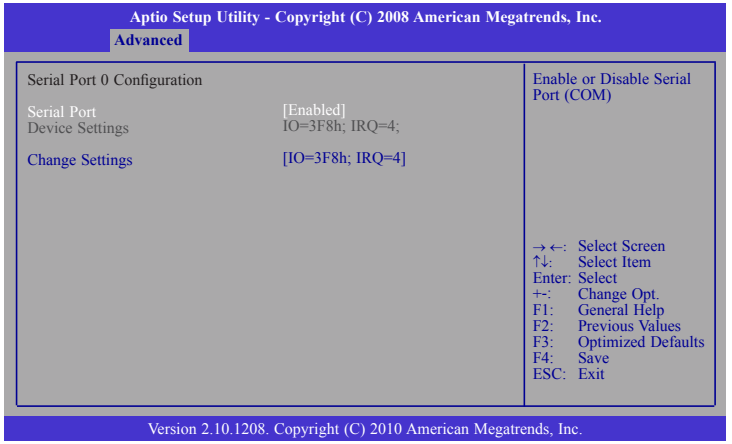


Super IO Chip

Displays the Super I/O chip used on the board.

Serial Port 0/1 Configuration

This section is used to configure the serial ports.



Serial Port

Enables or disables the serial port.

Change Settings

Selects an optimal settings for the Super IO device.

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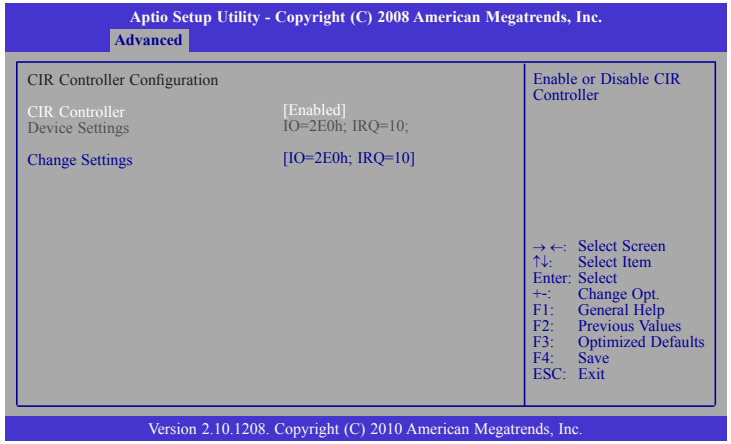
CIR Controller Configuration

This section is used to configure the CIR controller.



CIR Controller

Enables or disables the CIR controller.

Change Settings

Selects an optimal settings for the CIR device.

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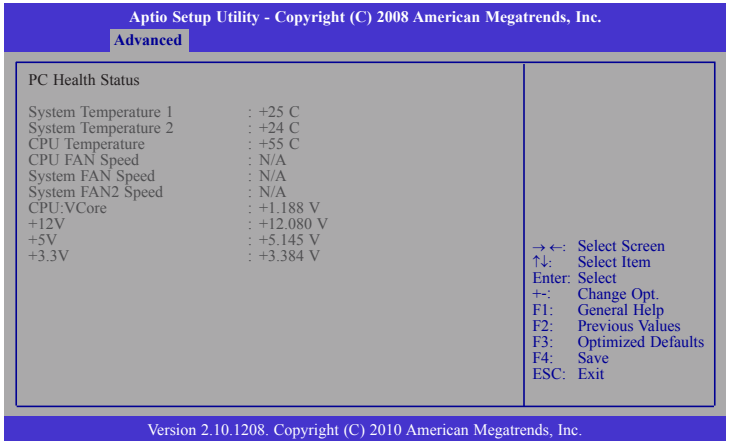
H/W Monitor

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.



System Temperature 1 to CPU Temperature

Detects and displays the internal temperature of the system and the current temperature of the CPU.

CPU Fan Speed to System Fan2 Speed

Detects and displays the current fan speed in RPM (Revolutions Per Minute).

CPU:Vcore to +3.3V

Detects and displays the output voltages.

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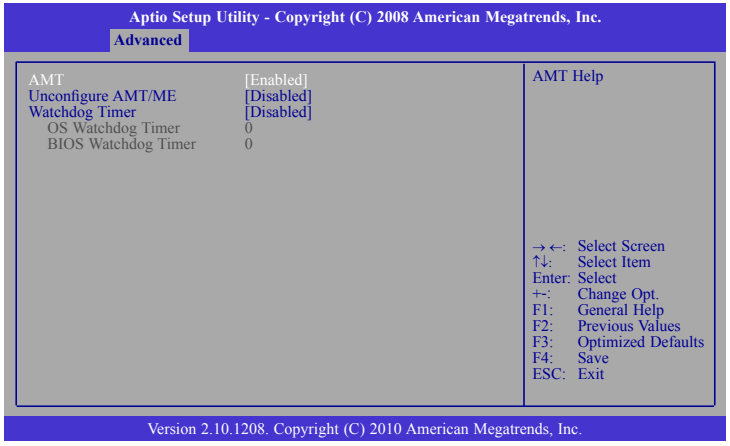
AMT Configuration

This section is used to configure AMT.



AMT

Enables or disables the AMT function.

Unconfigure AMT/ME

Select Enabled to unconfigure the AMT/ME function without the need for a password.

Watchdog Timer

Enables or disables the Watchdog Timer function.

OS Watchdog Timer

Selects the time interval of the OS Watchdog Timer.

BIOS Watchdog Timer

Selects the time interval of the BIOS Watchdog Timer.

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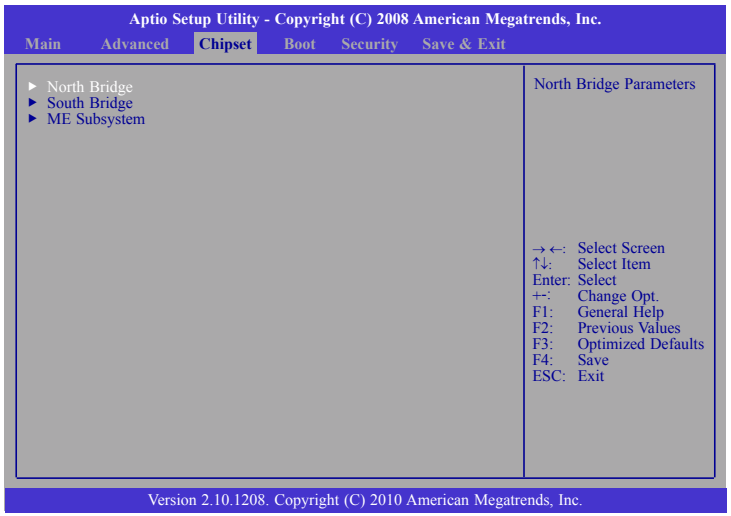
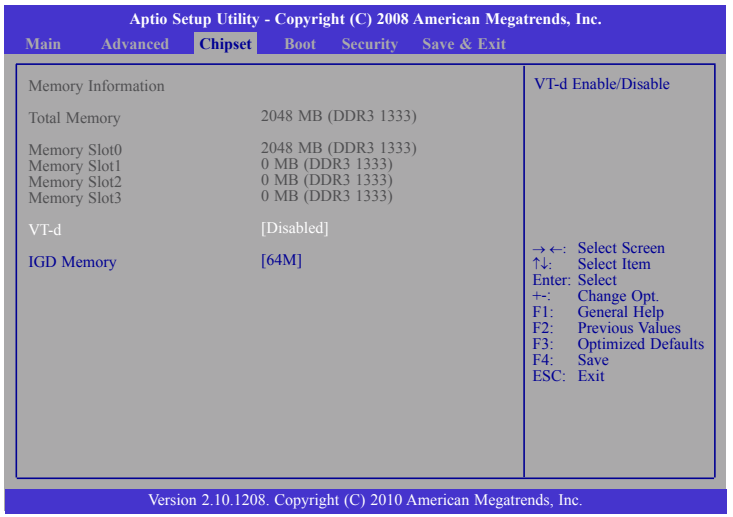
Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



North Bridge

This section is used to configure the north bridge features.



VT-d

The options are Enabled and Disabled.

IGD Memory

Selects the internal graphics device's shared memory size.

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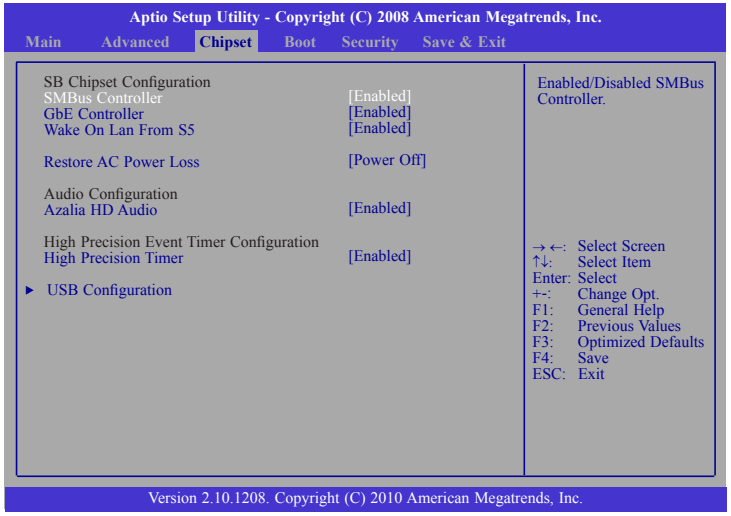
South Bridge

This section is used to configure the south bridge features.



SMBus Controller

Enables or disables the SMBus controller.

GbE Controller

Enables or disables the Gigabit LAN controller.

Wake On Lan From S5

When enabled, it allows the system to wake up from S5 via the network LAN.

Restore AC Power Loss

Power Off — When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

Power On — When power returns after an AC power failure, the system will automatically power-on.

Last State — When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Azalia HD Audio

Enables or disables the Azalia HD audio.

High Precision Timer

Enables or disables the high precision event timer.

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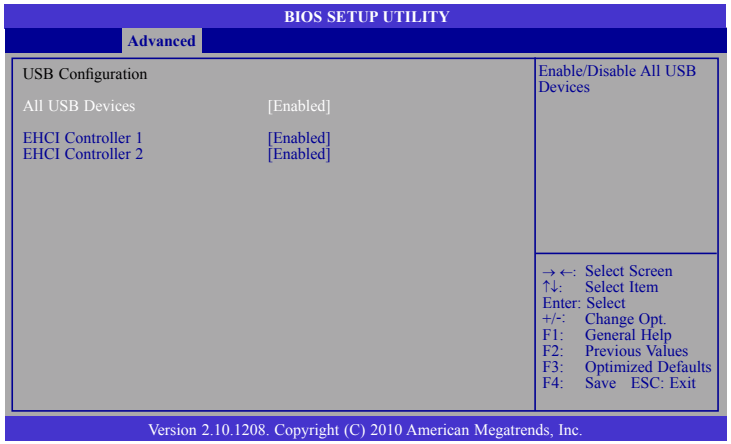
USB Configuration



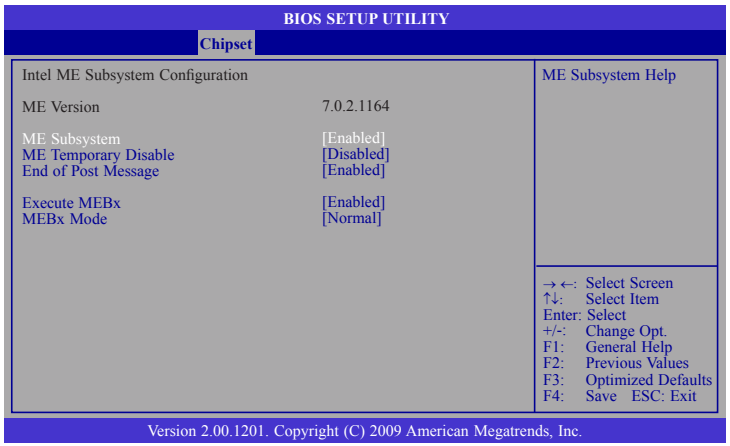
All USB Devices

Enables or disables all USB devices.

EHCI Controller 1 and EHCI Controller 2

Enables or disables the Enhanced Host Controller Interface (USB 2.0).

Intel ME Configuration



ME Subsystem

The options are Enabled and Disabled.

ME Temporary Disable

The options are Enabled and Disabled.

End of the POST Message

The options are Enabled and Disabled.

Execute MEBx

The options are Enabled and Disabled.

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MEBx Mode

The options are Normal, Hidden Ctrl + P and Enter MEBx Setup.

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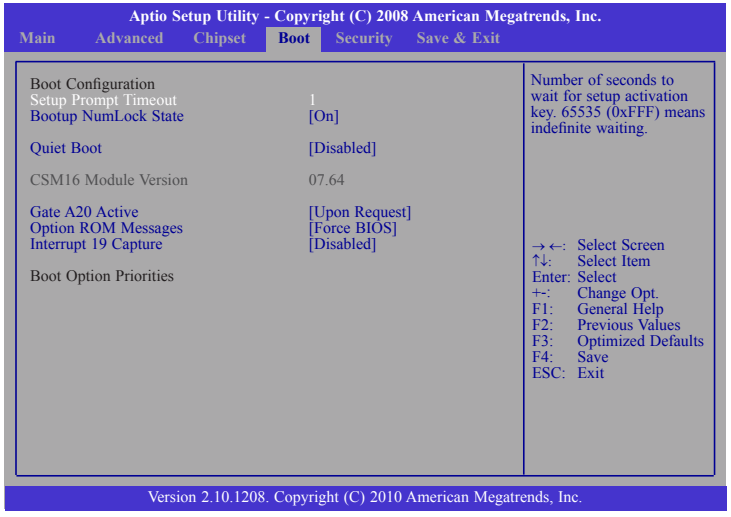
Boot



Setup Prompt Timeout

Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.

Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enabled	Displays OEM logo instead of the POST messages.
Disabled	Displays normal POST messages.

Gate A20 Active

Upon Request	GA20 can be disabled using BIOS services.
Always	Does not allow disabling GA20. This option is useful when an RT code is executed above 1MB.

Option ROM Messages

Selects the display mode for Option ROM. The options are Force BIOS and Keep Current.

Interrupt 19 Capture

When enabled, it allows the optional ROM to trap interrupt 19.

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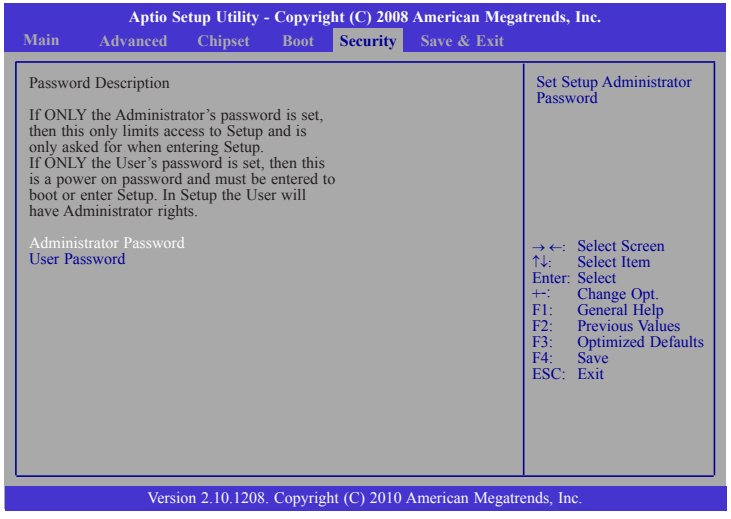
Security



Administrator Password

Sets the administrator password.

User Password

Sets the user password.

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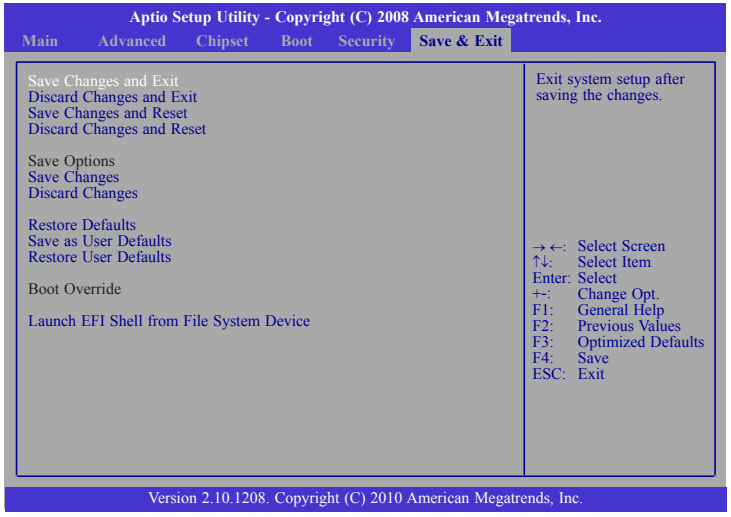
Save & Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F10> to save and exit Setup.

Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Save Changes and Reset

To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Discard Changes and Reset

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

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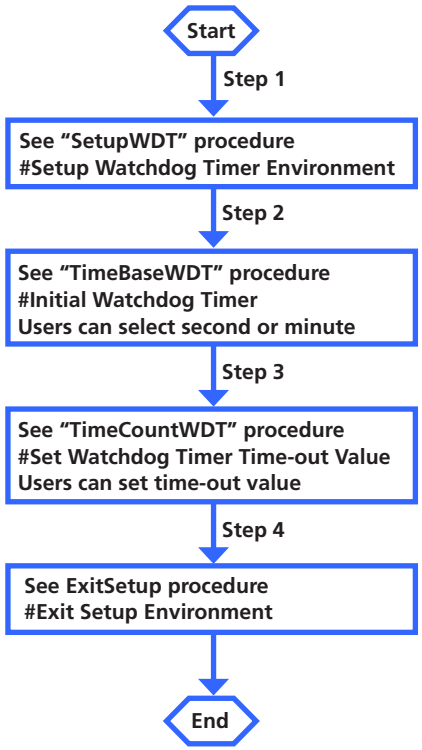
Appendix A: Watchdog Timer

WDT Programming Guide

NEX 880/890 Watchdog Function Configuration Sequence Description:



c:\>debug [enter]
-o 2e 87 ;Enter the Extended Function Mode
-o 2e 01
-o 2e 55
-o 2e 55
-o 2e 07 ;Logical Device Number Reg
-o 2f 07 ;LDN=7
-o 2e 72 ;Watch dog configuration
-o 2f XX ;minute mode or second mode
-o 2e 73 ;LSB for Watch dog tme out value
-o 2f YY
-o 2e 74 ;MSB for Watch dog tme out value
-o 2f ZZ

XX: 90 : Second mode
10 : minute mode
ex:
10 second timeout:
xx=90
yy=0a
zz=00

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Appendix B: GPIO Programming Sample Code

GPIO Programming Sample Code

```
#define GPIO_PORT          0x50F
#define GPO1                          (1<<3)
#define GPO2                          (1<<4)

void main(void)
{
  #Set GPO to be low
    outportb(GPIO_PORT, (inportb(GPIO_PORT) & (~GPO1) & (~GPO2) ));

  # Set GPO to be high
    outportb(GPIO_PORT, (inportb(GPIO_PORT) | GPO1 |GPO2 ));
}
```

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