



NEXCOM International Co., Ltd.

IoT Automation Solutions Business Group

EtherCAT Motion Controller

NET 3500-ECM

User Manual

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
Headquarters.....	x
Package Contents.....	xii
Ordering Information.....	xiii

Chapter 1: Product Introduction

Overview	1
Key Features	1
Product Appearance	2
Front Panel.....	2
Rear Panel	3
Hardware Specifications.....	4
Mechanical Dimensions.....	6

Chapter 2: Software Operation

NexECM Introduction.....	8
RTX Activation	9
Activate RTX with Internet Connection	9
Activate RTX without Internet Connection	10
Microsoft Visual Studio Installation.....	11
EtherCAT Utilities.....	16
EtherCAT Configuration Tool	16
NexECMRtxStartup	27
Acronis System Image Recovery	28
Activate Acronis Startup Recovery Manager	28
Backup Your NET Series System	29
Recover Your NET Series System.....	32

Chapter 3: Jumpers and Connectors

Before You Begin	34
Precautions	34
Jumper Settings	35
Locations of the Jumpers and Connectors.....	36
NISB 3500	36
Jumpers.....	38
Clear CMOS	38
Connector Pin Definitions	39
External I/O Interface - Front Panel	39
USB Ports	39
eSATA Ports.....	39

Status Indicators	40
LAN1/LAN2 Link/Active LED	40
ATX Power On/Off Switch	41
External I/O Interface - Rear Panel	42
PS/2 Keyboard/Mouse Port	42
9V-30V DC Input	43
GPIO Connector	43
Serial Interface (COM 1 - COM 4)	44
LAN Ports	46
USB Ports	47
VGA Port	47
DVI-I Port	48
Speaker-out Jack	48
Mic-in Jack	49
Internal Connectors	50
DC Power Output Connector.....	50
Reset Connector.....	50
SMBus DATA/CLK Pin Header.....	51
LVDS Backlight Power Select.....	51
LVDS Channel A Connector	52
LVDS Channel B Connector.....	52
LVDS Backlight Connector	53
SATA Ports	54
SATA Power Connectors	54
SATA DOM Power Connectors	55
USB Port Connector.....	55
COM4 RI Pin Header.....	56
GPIO LED Connector	56
Line-in Connector	57
Internal Power/HDD/LAN Power/LAN Active LED	57
Smart Fan Connectors	58
COM5 Connector	58
Parallel Connector	59

Chapter 4: Hardware Installation

Removing the Chassis Cover	60
Installing a DIMM.....	61
Installing the CPU	63
Installing a SATA Hard Drive	66
Installing a Full Length SATA DOM	69
Wallmount Brackets.....	71

Appendix A: BIOS Setup

About BIOS Setup	72
When to Configure the BIOS	72
Default Configuration	73
Entering Setup	73
Legends.....	73
BIOS Setup Utility	74

Appendix B: AMT Settings

Enable Intel® AMT in the AMI BIOS	87
Configure the Intel® ME Setup	88
Unconfigure AMT/ME	106

Appendix C: GPI/O Programming Guide 108

Appendix D: Watchdog Timer Setting..... 109

Appendix E: Intel Embedded AMT Management Express KVM..... 111

Appendix F: Intel Manageability Command Tool - KVM 118

Appendix G: External Anti-vibration Kit..... 124

PREFACE

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Acknowledgements

NET 3500-ECM is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B 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 B 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.

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.

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.

- The front of the Equipment requires wiring terminals with the following specifications:

Wire size: 30-12 AWG

Wire Type: copper wire only

Terminal Blocks Torque: 5-7 lb In.

For supply connections, use wires suitable for at least 75°C.

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.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
7. Do not leave this equipment in either an unconditioned environment or in a above 40°C storage temperature as this may damage the equipment.
8. The openings on the enclosure are for air convection to protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
10. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
13. Never pour any liquid into an opening. This may cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
16. Do not place heavy objects on the equipment.
17. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
18. **CAUTION: 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.**
19. The computer is provided with CD drives that comply with the appropriate safety standards including IEC 60825.

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

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.
3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

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.



Safety Warning: This equipment is intended for installation in a Restricted Access Location only.

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PACKAGE CONTENTS

Before continuing, verify that the NET 3500-ECM package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Description	Qty
1	60233POW33X00	DC Power Cable	1
2	6023344361X00	DB44 to 4x DB9 COM port cable	1
3	6029900037X00	DOW CORNING 340 Silicone Heat Sink Compound(3g)	1
4	4NCPM00203X00	2 Pin Phoenix Contact: MC 1.5/2-ST-3.81(1803578), 3.81mm pitch	1
5	50311F0110X00	Flat Head Screw for HDD F3x5 ISO+NYLOK NIGP	4
6	602DCD0269X00	NISB3500 CD DRIVER VER:1.0	1
7	7800000014X00	DVI-I TO VGA Adapter	1
8	5060600087X00	Mylar for PCI bracket	1
9	60177A0205X00	NISB3500 Quick Reference Guide VER:A	1
10	50311P0001X00	Plastic Screw for PCI card use	1
11	60233MK202X00	PS/2 Y Cable for Keyboard / Mouse, L:150mm	1
12	50322P0001X00	Plastic Nut for PCI card use	1

ORDERING INFORMATION

The following provides ordering information for NET 3500-ECM.

- **NET 3500 (P/N: A0J10350001X0)**
EtherCAT controller with one PCI expansion slot

Image Selection

NET 3500-ECM WES7 32-bit & RTX 2012 (P/N: 88J10350000X0)
NET 3500-ECM WES7 32-bit & RTX 2016 (P/N: 88J10350001X0)
NET 3500-ECM WES7 64-bit & RTX 2014 (P/N: 88J10350002X0)
NET 3500-ECM WES7 64-bit & RTX64 3.0 (P/N: 88J10350003X0)

- **19V, 120W AC/DC Power Adapter w/o power cord
(P/N: 7410120002X00)**

CHAPTER 1: PRODUCT INTRODUCTION

Overview

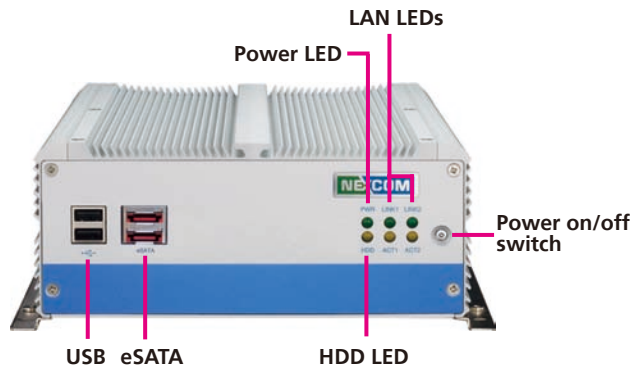
NET 3500-ECM features Intel® Turbo Boost and Intel® Hyper-Threading technologies (2 cores, 4 threads), as well as on-processor graphics and two DDRIII 800/1066 memory modules up to 4GB. In addition, NET 3500-ECM provides a wide variety of display I/O configurations and rich I/O interfaces including two Intel® GbE Ethernet ports, 5 x COM ports, 6 x USB, 8 x GPIO, 2 x SATAII, 2 x eSATA, audio interfaces. NET 3500-ECM is designed for a broad range of applications which demand an EtherCAT controller to handle advanced motion & I/O control.

Key Features

- Support Intel® Core™ i5-520M PGA processor
- EtherCAT technology with NexECM, Class A EtherCAT Master
- EtherCAT communication cycle up to 250 μ s
- Support CoE protocol
- Support high-level API for CiA 402 profile
- Built-in full function EtherCAT application configurator
- Dual VGA or VGA/DVI independent display
- 3 x RS232 and 1 x RS232/422/485 with Auto Flow Control
- 5th RS232 (option: 4 x digital input, 4 x digital output)
- Support +9 to 30V_{DC} power input; support ATX power mode

Product Appearance

Front Panel



USB

Used to connect USB 2.0/1.1 devices.

eSATA

Used to connect eSATA devices.

Power LED

Indicates the power status of the system.

HDD LED

Indicates the status of the hard drive.

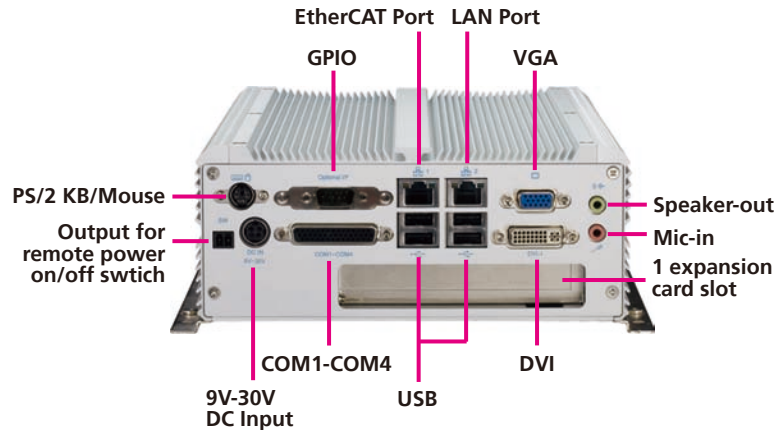
LAN LEDs

Indicate the status of the LAN ports.

Power On/Off Switch

Press to power-on or power-off the system.

Rear Panel



Output for Remote Power On/Off Switch

Used to connect a remote to power on/off the system.

PS/2 Keyboard/Mouse

Used to connect a PS/2 keyboard and PS/2 mouse via a cable.

9V-30V DC Input

Used to plug a DC power cord.

GPIO

The GPIO connector supports 4 digital input and 4 digital output.

COM1 to COM4

The DB44 port supports 3 RS232 and 1 RS232/422/485 compatible serial devices.

LAN

LAN 1: EtherCAT LAN port

LAN 2: GbE LAN port used to connect the system to a local area network.

USB

Used to connect USB 2.0/1.1 devices.

VGA

Used to connect an analog VGA monitor.

DVI

Used to connect a digital LCD panel.

Speaker-out

Used to connect a headphone or a speaker.

Mic-in

Used to connect an external microphone.

Expansion Slot

One PCI expansion slot.

Hardware Specifications

EtherCAT Master

- Slave module no.: up to 64
- Cycle time: up to 250 μ s
- Synchronization error: \pm 50ns
- Support CiA 402 standard protocol

CPU Support

- Support Intel® Core™ i5-520M PGA processor (2.4GHz, 3M Cache)

Main Memory

- 2x 2GB DDR3 SDRAM

I/O Interface - Front

- ATX power on/off switch
- HDD access/power status LEDs
- 2x USB 2.0 ports
- 2x eSATA ports

I/O Interface - Rear

- 2-pin remote power on/ff switch
- +9 to 30V_{DC} input
- 1x PS/2 for Keyboard/mouse
- 1x DB9 for COM5, RS232 (option: 4x GPI and 4x GPO)
- 1x DB44 serial port for 4x RS232
(COM2: RS232/422/485 with auto flow control)
- 2x GbE LAN ports; support WoL and PXE
- 4x USB 2.0 ports
- 1x DB15 VGA port

- 1x DVI-I port
- 1x Line-out and 1x Mic-in

Device

- 1x 2.5" HDD drive bay

Expansion

- 1x PCI expansion (10W max./per slot)
- Add-on card length: 169mm max.

Power Requirements

- ATX power mode
- Onboard DC to DC power support from +9 to 30V_{DC}
- Optional power adapter

Dimensions

- 195mm (W) x 268mm (D) x 80mm (H) (7.7" x 10.5" x 3.1")

Environment

- Operating temperature:
Ambient with air flow: -5°C to 55°C
(according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (non-condensing)
- Shock protection:
HDD: 20G, half sine, 11ms, IEC60068-2-27
- Vibration protection:
 - Random: 0.5Grms @ 5~500 Hz according to IEC68-2-64
 - Sinusoidal: 0.5 Grms @ 5~500 Hz according to IEC68-2-6

Certifications

- CE approval
- FCC Class B
- UL/cUL
- e13

Pre-Installed Software Package

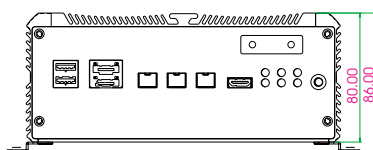
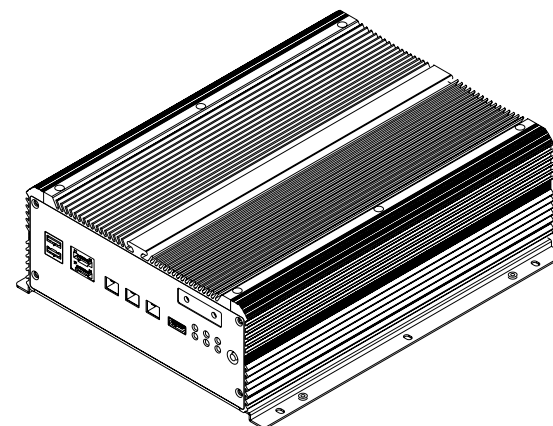
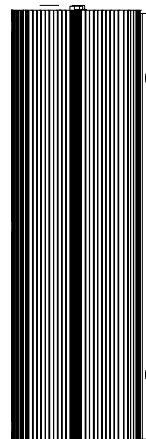
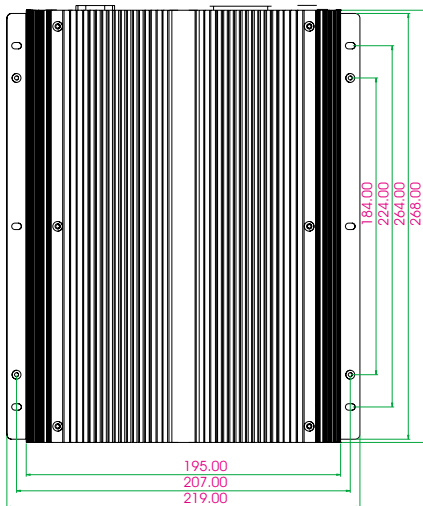
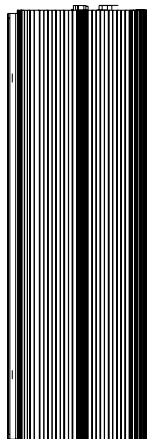
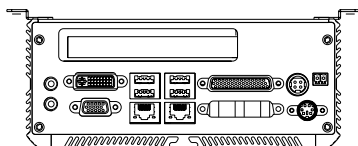
- Operating system: Windows Embedded Standard 7
- Real-time extension:
 - RTX2012/RTX2016 for 32-bit OS
 - RTX2014/RTX64 3.0 for 64-bit OS
- EtherCAT Master: NexECM
- EtherCAT configurator

EtherCAT Support Table

Feature Name	Short Description	NexECMRtx
Basic Features		
Service Commands	Support of all commands	✓
IRQ Field in Datagram	Use IRQ information from Slave in datagram header	✓
Slaves with Device Emulation	Support Slaves with and without application controller	✓
EtherCAT State Machine	Support of ESM special behavior	✓
Error Handling	Checking of network or slave errors, e.g. working counter	✓

Process Data Exchange		
Cyclic PDO	Cyclic process data exchange	✓
Network Configuration		
Reading ENI	Network configuration taken from ENI file	✓
Compare Network Configuration	Compare configured and existing network configuration during boot-up	✓
Explicit Device Identification	Identification used for hot connect and prevention against cable swapping	✓
Station Alias Addressing	Support configured station alias in slave, i.e. enable 2nd Address and use it	✓
Access to EEPROM	Support routines to access EEPROM via ESC register	✓
Mailbox Support		
Support Mailbox	Main functionality for mailbox transfer	✓
Mailbox Polling	Polling mailbox state in slaves	✓
CAN Application Layer Over EtherCAT (CoE)		
SDO Up/Download	Normal and expedited transfer	✓
Complete Access	Transfer the entire object (with all sub-indices) at once	✓
Distributed Clocks		
DC	Support of distributed clock	✓

Mechanical Dimensions

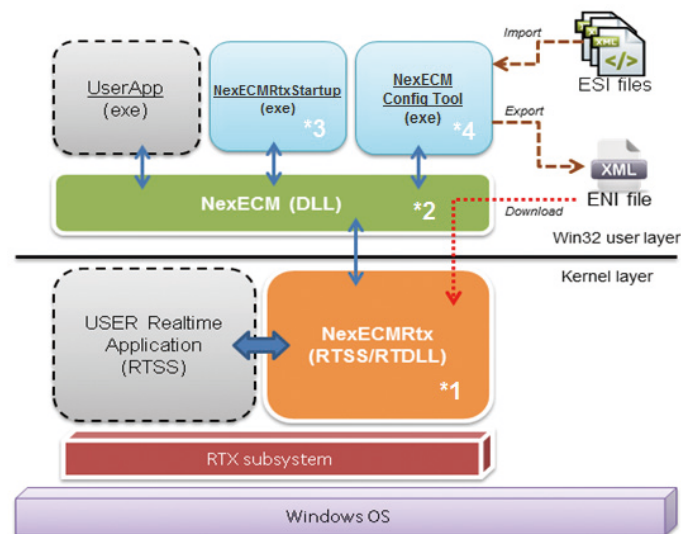


CHAPTER 2: SOFTWARE OPERATION

NET 3500-ECM is an EtherCAT master controller based on IntervalZero's real-time extension RTX. NET 3500-ECM integrates NEXCOM's EtherCAT master software, NexECMRtx, to implement real-time operation and high performance communication.

NET 3500-ECM Pre-Installed Software Package

- Operating system: Windows Embedded Standard
- Real-time extension: RTX
- EtherCAT master: NexECMRtx
- EtherCAT configurator



System Structure

- (*1) NexECMRtx.rtss - EtherCAT Master Runtime stack
- (*2) NexECM.dll - EtherCAT Master Win32 API libraries
- (*3) NexECMRtxStartup.exe - EtherCAT Master Startup utility
- (*4) NexECM Config Tool.exe - EtherCAT Master Configuration utility

The next section describes how to get started with the NET series platform, and the detailed steps of software operation.

NexECM Introduction

NexECMRtx is an EtherCAT Master Communication Protocol solution. It is based on IntervalZero's RTX (RTX is a real-time extension on Microsoft Windows) to offer real-time communication between EtherCAT master and EtherCAT slave devices. NexECMRtx offers high level C/C++ APIs for rapid application development.

NexECMRtx also provides a configuration utility - NexECM EtherCAT configuration tool, a graphic user interface tool for customers to edit parameters for EtherCAT communication between master and slave devices. Its functions are as follows:

- Step 1. Scan EtherCAT slave devices
- Step 2. Import ESI file, and export ENI file
- Step 3. Configure EtherCAT slave devices
- Step 4. Monitor EtherCAT communication quality
- Step 5. Test functions for EtherCAT slave devices

According to the EtherCAT standard document: ETG.1500, NexECMRtx currently supports Master functions, which are shown in the table below:

✓: Ready, △: By Project Request

Feature Name	Short Description	NexECMRtx
Basic Features		
Service Commands	Support of all commands	✓
IRQ Field in Datagram	Use IRQ information from Slave in datagram header	✓
Slaves with Device Emulation	Support Slaves with and without application controller	✓

EtherCAT State Machine	Support of ESM special behavior	✓
Error Handling	Checking of network or slave errors, e.g. working counter	✓
Process Data Exchange		
Cyclic PDO	Cyclic process data exchange	✓
Network Configuration		
Reading ENI	Network configuration taken from ENI file	✓
Compare Network Configuration	Compare configured and existing network configuration during boot-up	✓
Explicit Device Identification	Identification used for hot connect and prevention against cable swapping	✓
Station Alias Addressing	Support configured station alias in slave, i.e. enable 2nd Address and use it	✓
Access to EEPROM	Support routines to access EEPROM via ESC register	✓
Mailbox Support		
Support Mailbox	Main functionality for mailbox transfer	✓
Mailbox Polling	Polling mailbox state in slaves	✓
CAN Application Layer Over EtherCAT (CoE)		
SDO Up/Download	Normal and expedited transfer	✓
Complete Access	Transfer the entire object (with all sub-indices) at once	✓
SDO Info Service	Services to read object dictionary	✓
Emergency Message	Receive emergency messages	✓

Ethernet over EtherCAT (EoE)		
EoE	Ethernet over EtherCAT	△
File over EtherCAT (FoE)		
FoE	File over EtherCAT	△
Servo over EtherCAT (SoE)		
SoE	Servo over EtherCAT	△
Distributed Clocks		
DC	Support of Distributed Clock	✓

Documents for more detailed information about NexECM can be found from **Start > All Programs > NEXCOM > NexECMRtx > Doc.**

RTX Activation

Every NET series platform comes with a sticker on the bottom of the platform that contains a set of RTX activation key. You need to activate RTX with the runtime license to start EtherCAT master and related operations. The steps required to activate your product will depend on whether or not the machine is connected to the Internet.

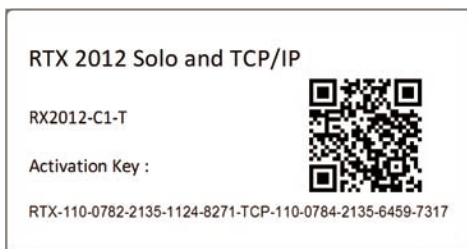


Figure 1. RTX Activation Key Sticker

Activate RTX with Internet Connection

Step 1. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero > RTX 2012 > RTX Activation.**

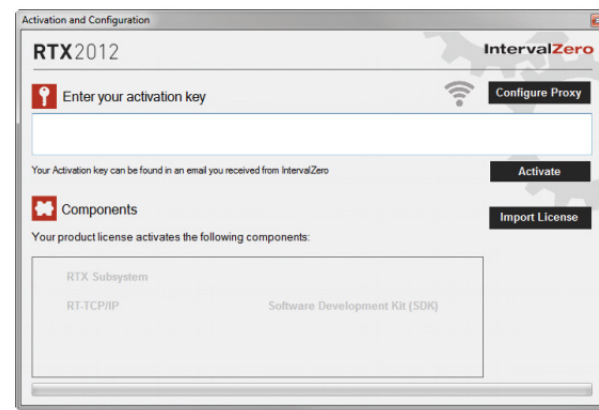


Figure 2. Activation Dialog

Step 2. Make sure your machine is connected to the Internet with access to the License Server. If no network connection is found, make sure all network cables are plugged in and click the Network icon to refresh. If a network connection still isn't found, you may need to configure a Proxy Server.

Step 3. Enter the activation key and then click **Activate**. The product components activated by your key are indicated by a check mark in the *Components* box.

You need to enter the full Activation Key at once! Take *Figure 1* as example, the Activation key you should key in is:

RTX-110-0782-2135-1124-8271-TCP-110-0784-2135-6459-7317



Figure 3. Key Section in the Sticker

Activate RTX without Internet Connection

If the computer on which you installed RTX is not connected to the Internet, the activation process requires a few additional steps.

Step 1. Open the **Activation and Configuration** dialog. You can launch it from **Start > All Programs > IntervalZero > RTX 2012 > RTX Activation**.

Step 2. Check your Internet connection. Continue with these steps only if there is no connection to the Internet. If you are connected, follow the steps in the previous section.

Step 3. Enter your activation key and then click **Activate**.

Step 4. In the dialog that appears, click **Yes** to create a fingerprint file.

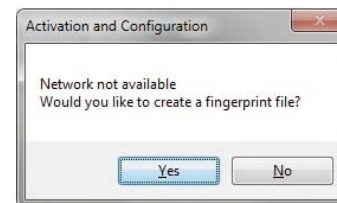


Figure 4. Fingerprint Dialog

Step 5. In the **Save As** dialog, name the file fingerprint.rfp. By default, the file will be saved to the desktop.

Step 6. Navigate to the desktop, and then copy and paste the file fingerprint.rfp to an external device.

Step 7. Connect the device to a machine with Internet connectivity.

Step 8. Launch a web browser, and navigate to <http://Activation.IntervalZero.com>.

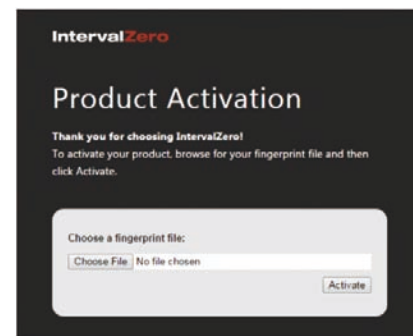


Figure 5. Product Activation Website

Step 9. Browse for and open the file fingerprint.rfp.

Step 10. Click **Activate** to generate a license (.lic) file.

Step 11. In the **File Download** dialog, click **Save**.

Step 12. Copy the file License.lic to the external device, and transfer it to the machine on which RTX is installed.

Step 13. In the **Product Activation** dialog, click **Import License File**.

Step 14. Browse for and open the file License.lic.

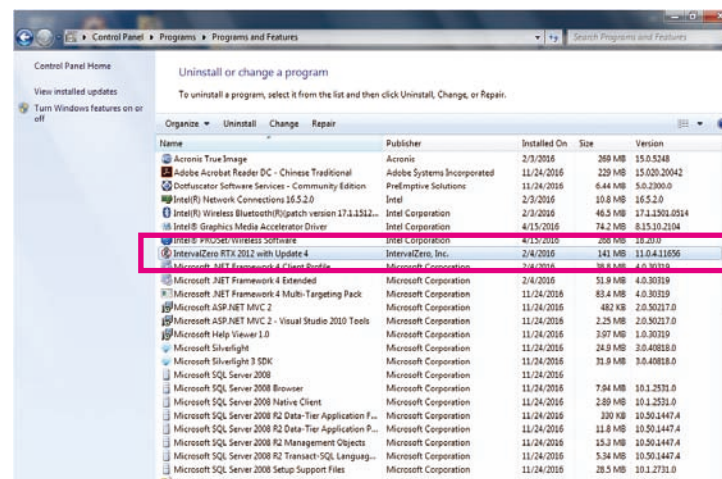
Microsoft Visual Studio Installation

For all of the NET series platforms, RTX are pre-installed. If you want to build RTX programs in Visual Studio, please refer to the following installation steps.

Step 1. Install Visual Studio. The supported versions list is in the table below.

Operating System	RTX Version	Visual Studio Version
WES7, 32-bit	RTX 2012	Visual Studio 2010 Visual Studio 2012
	RTX 2016	Visual Studio 2013 Visual Studio 2015
WES7, 64-bit	RTX64 2014	Visual Studio 2013 and up
	RTX64 3.0	Visual Studio 2013 and up

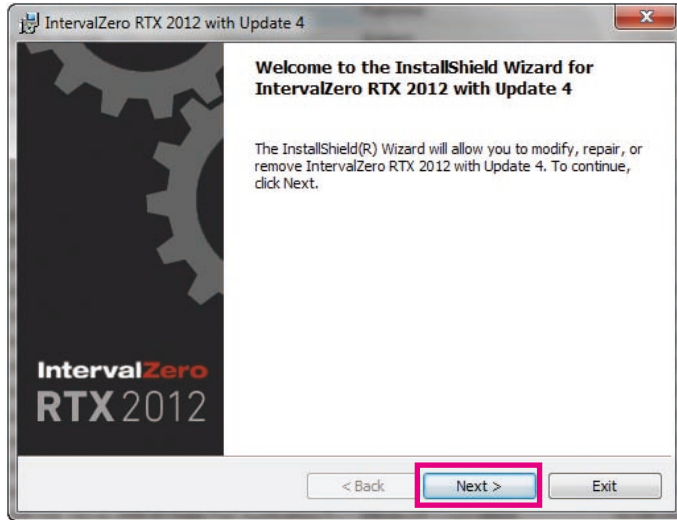
Step 2. After installation, please check the RTX Version on the NET platform. (**Windows > Start Menu > Control Panel > Programs > Programs and Features**). As shown in the example, the version is IntervalZero RTX 2012 with Update 4.



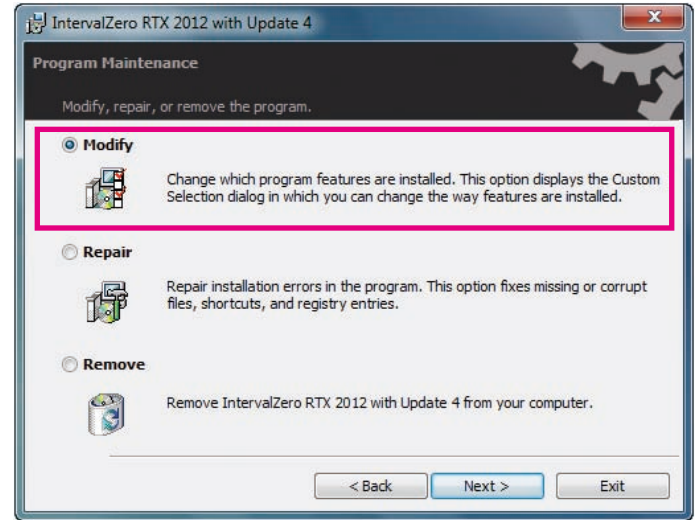
Step 3. Download the related RTX runtime installation file, from the IntervalZero download site.

- RTX 2102
(<http://www.intervalzero.com/rtx-2012-downloads/>)
- RTX 2016
(<http://www.intervalzero.com/rtx-2016-downloads/>)
- RTX64 2014
(<https://www.intervalzero.com/rtx-downloads/rtx64-downloads/rtx64-2014-downloads/>)
- RTX64 3.0
(<https://www.intervalzero.com/rtx-downloads/rtx64-downloads/rtx64-3-0-downloads/>)

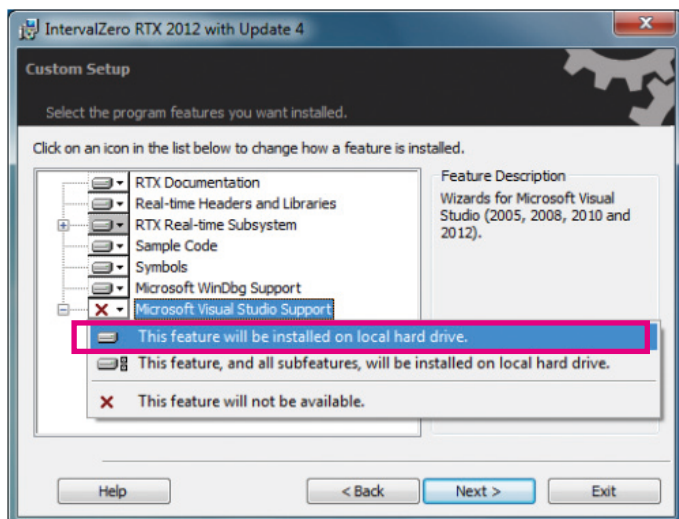
Step 4. Double-click the RTX install package, and click **Next >**.



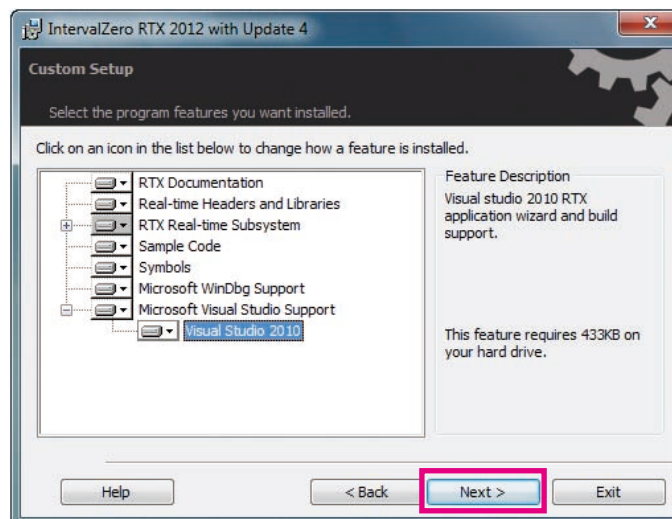
Step 5. Select **Modify**.



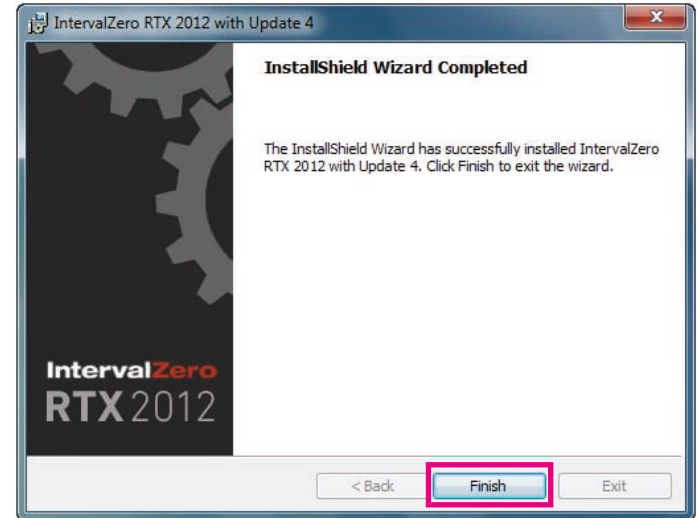
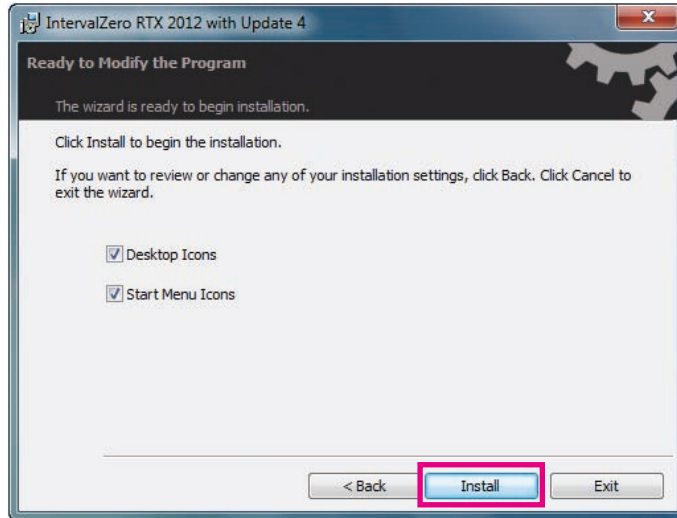
Step 6. Add the installed Visual Studio software in the list.



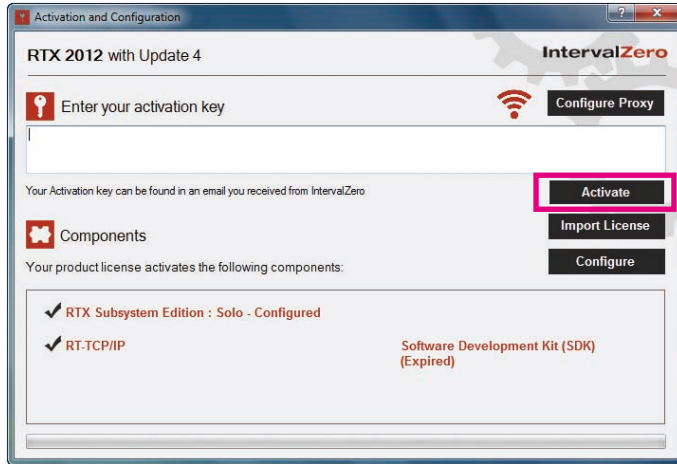
Step 7. Click **Next >**.



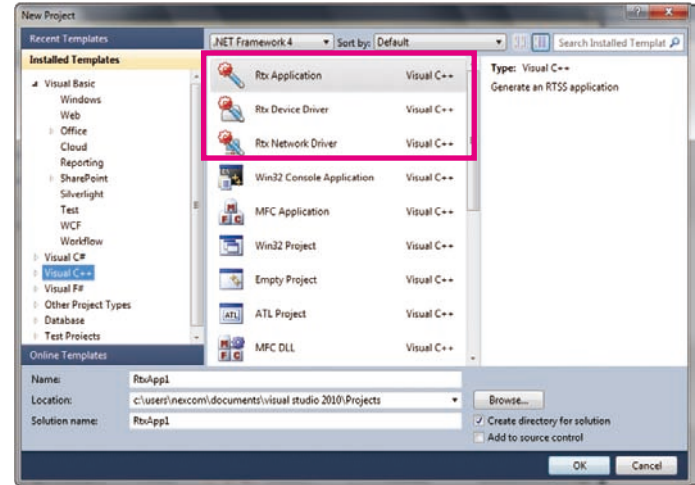
Step 8. Click **Install**, and then click **Finish**.



Step 9. Activate RTX license, you can refer to the previous section for the activation steps.



Step 10. After completing the steps, you can start to build your RTX program.



EtherCAT Utilities

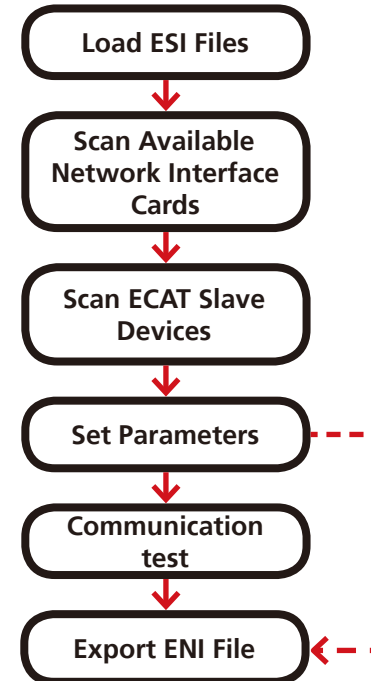
EtherCAT Configuration Tool

You can achieve the following with the NexECM Configuration Tool master utility:

1. Scan EtherCAT slave device
2. Import ESI file, and export ENI file
3. Edit CoE slave devices PDO mapping
4. ProcessData access
5. CoE slave devices SDO communication test
6. Monitor EtherCAT communication quality
7. Test slave devices' operation

Operation Flow

The basic operation flow of NexECM Configuration Tool is as follows:



ESI: An XML file to describe the EtherCAT Slave Devices Information.

ENI: An XML file to describe the EtherCAT Network Information.

- **Load ESI Files:**

When NexECM Configuration Tool starts, it will automatically import all the files in the folder whose location is "Program Files/NEXCOM/NexECMRtx/tools/x32/ESI_File" or "Program Files/NEXCOM/NexECMRtx/tools/x32/ESI_File."

- **Scan Available Network Interface Cards:**

NexECM Configuration Tool detects RTX environment and automatically finds all available network interface cards. RTX network interface card drivers are pre-installed on every NET series platform, and LAN1 of the platform is set as EtherCAT port.

- **Scan ECAT Slave Devices:**

NexECM Configuration Tool scans the ECAT slave devices on the selected network port. If a device has no matched ESI file (VendorID, DeviceID not matched), it will be defined as "Unknown". Move the mouse cursor to "Unknown" device will pop up the hardware information (VendorID, DeviceID and RevisionNumber).

- **Set Parameters:**

NexECM Configuration Tool generates the plan of PDO and ProcessData memory according to ESI files, then export to ENI file automatically. Users can also use the NexECM Configuration Tool built-in PDO mapping editor to customize their own plan, and then export the final setting to ENI file.

- **Communication Test:**

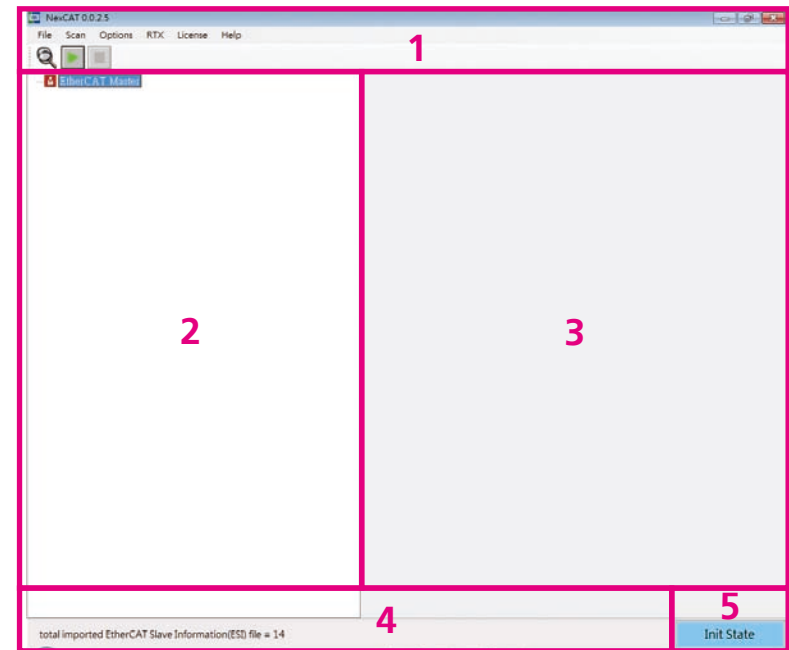
User can start all the EC-Slave devices directly; the status will be changed from initial state (INIT) to operation state (OP). If there is a slave device which cannot be transferred to the operation state successfully, you can find the status and messages from the main page's area 4 and area 5 (in the following figure).

- **Export ENI file:**

If the tests on each devices show normal, the user can use the function "Export ENI", to export the ENI file to the storage device. Actually, when you use the "Start Network" feature, the system automatically exports the current settings and network topology to ENI file. (The default path is C:\ENI_NexCAT_Export.xml)




NexECM Configuration Tool Main Page

The NexECM Configuration Tool Main Page is divided into 5 areas, we will explain it in the following:



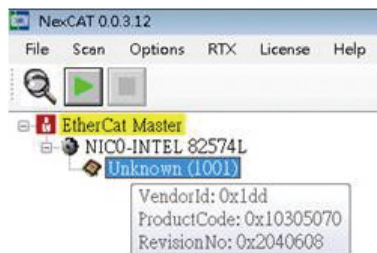
- **Area 1:**

Shows the software name and version, e.g. NexECM Configuration Tool0025.

Icon	Description
	Scan NIC: Find the available network interface and display it on the form
	Start Network: Start communication and export ENI file to the default path (C:\)
	Stop Network: Stop all communication of EtherCAT slave devices

- **Area 2:**

Shows the entire network topology and all online EtherCAT slave devices. If the EtherCAT slave device fails to be scanned and shows “Unknown”, please update the ESI file of the slave device by contacting the slave device supplier and import it again.



“Unknown” device: Popup info when cursor is moved onto the item.

- **Area 3:**

Shows the menu of parameters. You can set the slave device parameters and master parameters here.

- **Area 4:**

Shows message and error code.

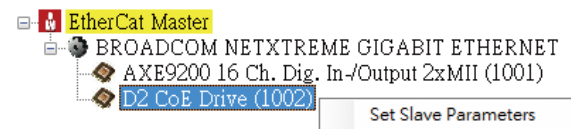
- **Area 5:**

Shows the state of EtherCAT slave devices. Currently we have 4 states:

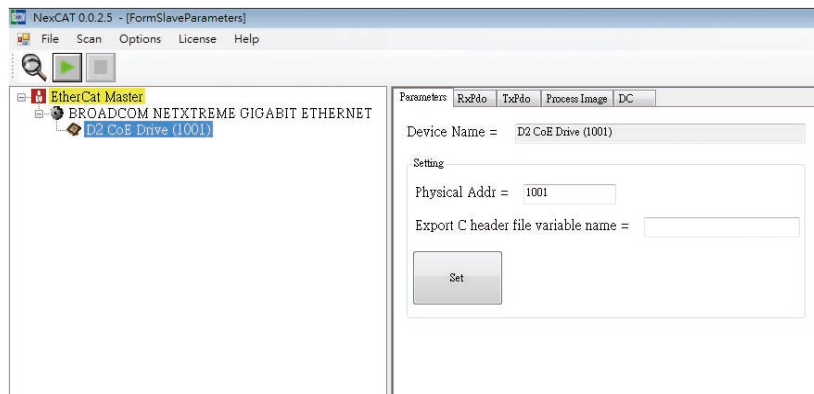
1. **Initial:** There is no communication and all slave devices are in initial state.
2. **Error:** There is communication but slave devices cannot be switched to OP state. Common errors are: ENI file does not match with the actual network topology; ESI version does not match with the slave device version and so on.
3. **Retry:** When the parameter “Link Error Mode” of ECAT master is set to “Auto re-connect” (refer to the NexECMRtx User Manual “Chapter 3.1.6”) and slave device is in “OP” state but experiencing a link problem, the master will show “Retry” status and attempt to re-connect the disconnected slaves until they are working. Master will also try to re-connect those lost link modules, while other modules can operate as usual. This status is displayed continuously until all slaves are back to “OP” state.
4. **Running:** Network is connected and all slave devices are in “OP” state.

Set Slave Parameters

Select the slave device and right click to bring up a pop-up menu, choose “Set Slave Parameters”.



Slave device setting page must be used before starting the Network, because all the parameters changed are valid only before the start of the Network. If user changed the settings after starting the Network, a network re-start is needed.



1. Parameters Tab

Device Name =

Setting

Physical Addr =

Export C header file variable name =

Device Name: Shows the name of current selected slave device.

Physical Addr: Defines the node address (configured address) for a slave device.

Export C header file variable name: Exports the process image for each slave, it must be used with function "Export C file" of Master Parameters setting (refer to the NexECMRtx User Manual "Chapter 3.1.6").

```
#define _Physical Addrsss (+variable name)_ObjectName
[ProcessData offset]
```

Example:

Export C header file variable name= "_AXIS"

Export C header will be:

```
#define _1001_AXIS_Statusword                16777216
#define _1001_AXIS_PositionActualValue      16777218
#define _1001_AXIS_VelocityActualValue      16777222
#define _1001_AXIS_Controlword              16777216
#define _1001_AXIS_TargetPosition          16777218
```


2. RxPdo & TxPdo Tab

RxPdo Name	Index/Ref	SM	Mandatory	Fixed
RxPdo 1	1600	2	-1	0
RxPdo 2	1601	-1	-1	0
RxPdo 3	1602	-1	-1	0

Entry Name	Index/Ref	Sub Index	Bit Len	Data Type
Controlword	607A	0	16	UINT
Target Position	0000	0	32	DINT
	0000	0	0	
	0000	0	0	

Table Description:

- **RxPdo(TxPdo) Name:** Default name is based from ESI file, user can change and export it to ENI.
- **Index:** Parameters from CoE. Changes are not recommended.
- **SM:** Number of Sync Manager, user can change the value.
- **Mandatory:** Defines the necessary parameters.
- **Fixed:** Defines which parameter the user can change.
- **Entry Name:** From CoE, user can change and export it to ENI.
- **Indicator:** Parameter from CoE. Changes are not recommended.
- **Sub Indicator:** Parameter from CoE. Changes are not recommended.
- **BitLen:** Parameter from CoE. Changes are not recommended.
- **Data Type:** Parameter from CoE. Changes are not recommended.
- **Save Button:** Save changes after editing.
- **Default Button:** Revert to default ESI setting.
- **Clear All Button:** Clear PDO setting.

3. Process Image Tab

User can edit settings in the “RxPdo” or “TxPdo” tab. After editing, you can check the corresponding memory address in this tab. The edited settings will be valid after you click on the **save** button.

Input Name	Data Type	BitSize	BitOffset	Memory Address	Output Name	Data Type	BitSize	BitOffset	Memory Address
Statusword	UINT	16	328	16777216	Controlword	UINT	16	328	16777220
Position Actual Value	DINT	32	344	16777220	Target Position	DINT	32	344	16777224
Velocity Actual Value	DINT	32	376	16777224					

Table description:

- **Input(Output) Name:** Uses the name in the “RxPdo” or “TxPdo” tab.
- **BitSize:** Variables Memory Size.
- **BitOffset:** Variable Offset (based on setting in “RxPdo” or “TxPdo”).
- **Memory Address:** Variables Memory Address.

4. DC Tab

This tab is used to set DC mode. Default DC settings of each slave are from its ESI file.

- **Mode (Description):**

Select the DC mode. If the slave supports DC mode, the default is enable "DC" sync mode. As long as (a) slave(s) device's DC mode can be selected in the network, EtherCAT Master will have a DC output information (function) of ENI File. To turn off the DC function from the network, the user must set all slaves as "free run" mode.

- **DC SYNC Activation: (ESC Register 0x0980~0x0981)**

0x0000 – Disable SYNC0 & SYNC1 (Free Run)
 0x0300 – Activate SYNC0 (DC Sync)
 0x0700 – Activate SYNC0 & SYNC1

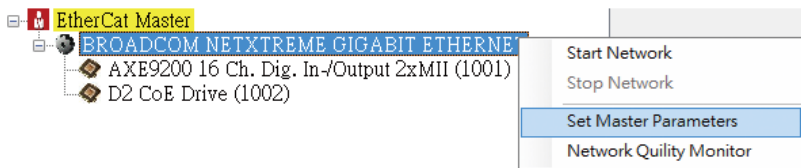
This is an advanced setting. This column will be displayed according to the ESI file selected in the DC mode. It is used to control DC SYNC signal output. Generally leave it at default.

- **Apply To Other:**

Apply current slave device's settings to other slaves. Clicking the button will pop up the following dialog.

Set Master Parameters

Select the device and right click to bring up the pop-up menu, choose "Set Master Parameters".

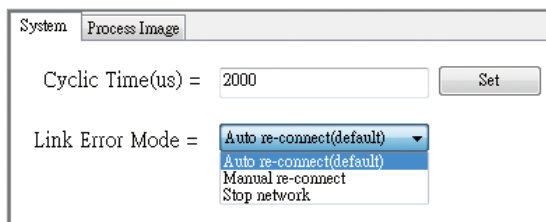


There are 2 tabs:

1. System
2. ProcessImage

Described as below:

System Tab



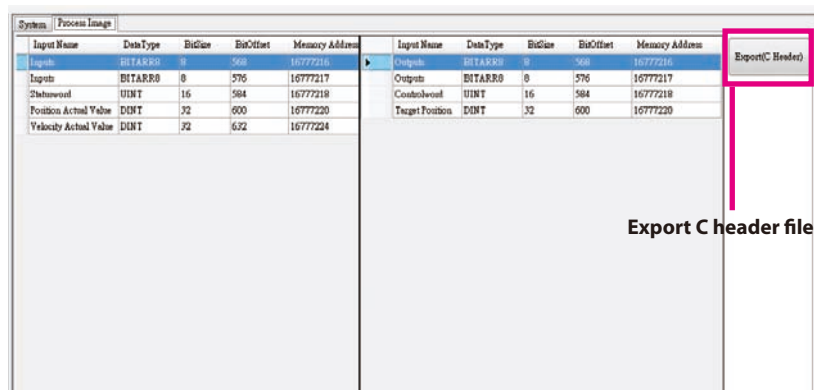
The Cyclic Time: Used to set the system performance. The values are communication time or refresh frequency between EC-Master and EC-Slave devices. The minimum value can't be larger than system limit value. This also can be set by calling API. Unit is micro second (us).

Link Error Mode: Behavior when there is a link error. After the network has been started, slave devices will be in "Operation" state. There are three modes when EC-Master detects the link error:

User also can set the mode by calling API, please refer to the NexECMRtx User Manual "Chapter 6.2".

- **Auto re-connect(default):** When a slave device loses communication, the main page "Area 5" will show "Slave Retry" message, while the system continues to re-connect automatically until the connection succeeds. Other slave devices continue to work at the same time.
- **Manual re-connect:** When a slave device loses communication, other slave devices will continue to work normally. The main page "Area 5" will show "Error message" and continue the next time when a network connection is successful.
- **Stop network:** When a slave device loses communication, EC-Master will stop the network. The main page "Area 5" will show "Error message".

Process Image Tab



Network process image map

The format is the same with the process image of a slave described in the NexECMRtx User Manual "Chapter 3.1.5", but here you can see the memory allocation for the entire network topology, or use "Export C Header File" function to output variables of each slave device. You also can write your own program when the memory is accessed directly through the API.

Export C header file for process image map

Click "Export C Header File" button.

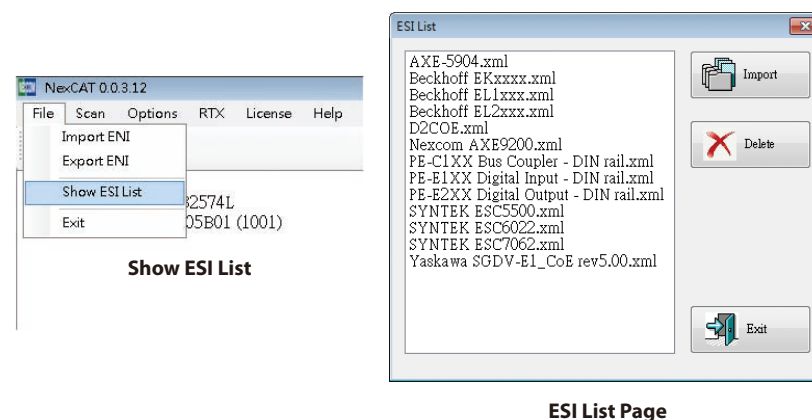
PDO memory mapping offset can be output as a C header (*.h), It is easy to maintain your code using the define symbol when PDO mapping has changed. Output symbol format please refer to the NexECMRtx User Manual "Chapter 3.1.5".

ESI List (ESI File Management)

When using NexECM Configuration Tool to scan the devices, you can get how many slave devices and obtain hardware information (e.g. Device ID etc). Through comparing the information, NexECM Configuration Tool will get which ESI belongs to. (About ESI file please refer to the NexECMRtx User Manual "Chapter 3.1.3"). If users get a new ECAT slave device, they must import the ESI of the device.

2 methods to manage the ESI files:

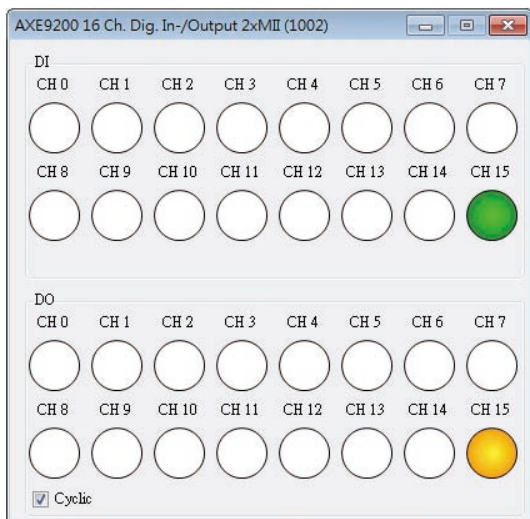
1. Add/Remove the ESI file to the specified folder directly. When you add a new ESI file, you need to restart the NexECM Configuration Tool.
2. Use "ESI list" page to import/delete ESI files. The action of import & delete is applied immediately. No need to restart the NexECM Configuration Tool.



DIO User Interface

In Area 2, double-click the selected DIO slave device which you want to test, the DIO operation menu will appear. NexECM Configuration Tool will determine the device for DI, DO or DIO devices and automatically calculate the number of IO.

When the mouse cursor is at the DO button, the user can manually press DO button to operate DO, or user can use the “Cyclic function” and let the DO slave device to run automatically to start Marquee features starting from small (0) to large, and repeated run. After you check the box for Cyclic, it operates automatically. After the check is canceled, the program stops at the last channel being executed in operation.

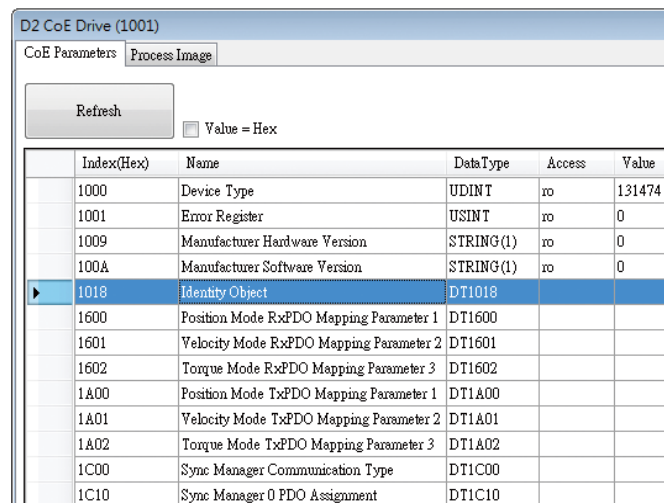


CoE-SDO Operation Page

In Area 2, double-click the selected CoE slave device which you want to test, the CoE operation menu will appear. NexECM Configuration Tool will automatically determine whether the slave device supports CIA 402.

Press the Refresh button and this will update parameter values automatically, the user can choose to represent decimal or hexadecimal display format. If a parameter is float, then the parameter from binary system will display in float.

If the user wants to change parameters value, you can use the mouse and click the left button twice quickly to edit the parameters value. After editing is complete, press the Enter key or leave the table then it can be successfully written. If the write fails or does not meet the standard written format data form, the parameter values automatically go back to the state before editing.



CoE Parameters

If the parameter of data type is "data type", it indicates that the parameters contain sub parameters (Sub index). The user may want to access the parameters by double-clicking the mouse, and determine if the program has sub parameters (Sub Indicator). There will be a child window shown below. It is the same to read and write as mentioned in previous chapter.

The screenshot shows a dialog box titled "Identity Object" with a "Value = Hex" checkbox and a "Refresh" button. Below is a table of sub-parameters:

Sub Index	Name	Data Type	Access	Value
0	number of entries	USINT	ro	04
1	Vendor Id	UDINT	ro	0000aaaa
2	Product Code	UDINT	ro	00000003
3	Revision number	UDINT	ro	00000001
4	Serial number	UDINT	ro	00000001

Sub Parameters

Process Image Parameters Operation Page

The screenshot shows a window titled "D2 CoE Drive (1001)" with tabs for "CoE Parameters" and "Process Image". It has checkboxes for "Input Data = Hex" and "Output Data = Hex". Below are two tables:

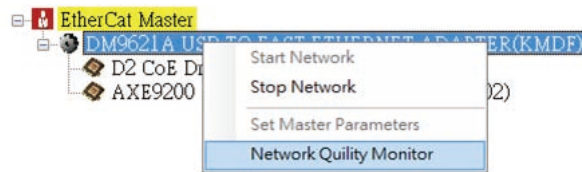
Input Name	Data Type	BitSize	BitOffset	Data
▶ Statusword	UDINT	16	568	96
Position Actual Value	DINT	32	584	2342
Velocity Actual Value	DINT	32	616	0

Output Name	Data Type	BitSize	BitOffset	Data
▶ Controlword	UDINT	16	568	
Target Position	DINT	32	584	

Users can access PDO (process data object) data after starting the network. When the checkbox "input data (output data) = hex" is checked, the data in the table is display as hexadecimal format.

Network Quality Monitor

Users can open network communication quality test page after starting the network. Perform a Master to each slave device communication packet test. To show this page, you can right click the mouse on the node of network card (NIC) in NexECM Configuration Tool Area 2 and select "Network Quality Monitor" and the Network quality test page will appear.



Right Click on the NIC node

Inc Address	Send Frame Count	Recv Frame Count	Lost Frame Count	Error Data Count
0	242	242	0	0
1	242	242	0	0

Buttons: Stop Send, Clear All

Network Quality Monitor Page

- **Inc Address:** The Slave ID will follow the order of the scanned, zero based.
- **Send Frame Count:** The numbers of test frames are sent to slave device, check if the slave devices are in "OP" state. The frequency of the send frames is 10 ms.
- **Recv Frame Count:** The number of response frames. Normally, Both Send Frame Count and Recv Frame Count should be consistent.
- **Lost Frame Count:** Lost frames.
- **Error Frame Count:** The return frames data content does not belong to the slave device and state != OP.

Their relationship are as the following:

Send Frame count = Recv Frame count + Lost Frame count

Recv Frame count = Normal Frame (state == OP) + Error Data Frame count.

NexECMRtxStartup

“NexECMRtxStartup.exe” provides the convenience while you're using EtherCAT Master. Based on “NexECMRtxConfig.ini”, we offer 3 major functions:

1. Load EtherCAT Master - NexECMRtx.rtss
2. Download ENI file (EtherCAT Network Information)
3. Load user's RTX application (ex: UserRTXApp.rtss)

You can modify NexECMRtxStartup.ini content by “Notepad” or text editing software to meet your current files placed circumstances. Usually you need to modify “Application path” and “Network information file (ENI) path”. You can find the “.ini” files “C:\Program Files\NEXCOM\NexECMRtx\tools”. Please refer to the following illustration.

```

NexECMRtxConfig.ini - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

[PATH_ENI]
PATH = D:\NEXCOM\EtherCAT\ENI_EXAMPLE.xml
OPTION = 1

[PATH_NEXECMRtx_DRIVER]
PATH = C:\ProgramFiles\NexCom\NexECMRtx.rtss

[PATH_USER_APP]
PATH = D:\ProgramFiles\NexCom\UserApp.exe
  
```

NexECMRtxConfig.ini Content

	Description
PATH_ENI	
PATH:	Network Information File (ENI) Path OPTION: Check the network interface card information by using ENI file. 0: Use ENI file. 1: Do not use ENI file, use Parameter setting.
PATH_NEXECMRtx_DRIVER	
PATH:	NexECMRtx.rtss File Path
PATH_USER_APP (Option)	
PATH:	Fill your RTX application (*.rtss) path and file name.

Acronis System Image Recovery

Every NET system platform is equipped with **Acronis Startup Recovery Manager** and users need to activate it in Windows first to enable its recovery function. **Acronis Startup Recovery Manager** is a modification of the bootable agent, residing on the system disk in Windows and configured to start at boot time on pressing F11. It eliminates the need for a separate media or network connection to start the bootable rescue utility.

Activate Acronis Startup Recovery Manager

Please refer to the following steps to activate **Acronis Startup Recovery Manager**.

Step 1. Open **Acronis** on your desktop, choose **Tools and utilities** page then click **Acronis Startup Recovery Manager**.

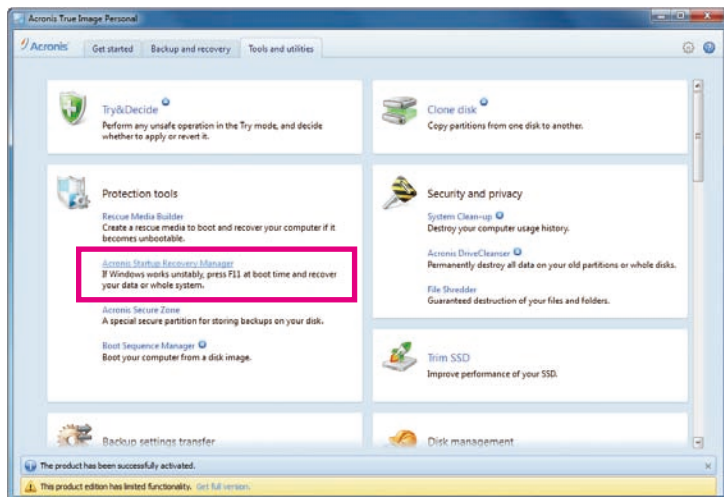


Figure 1. Acronis Startup Page

Step 2. Click **Activate**, then you will see the successful information. (Figure 3)

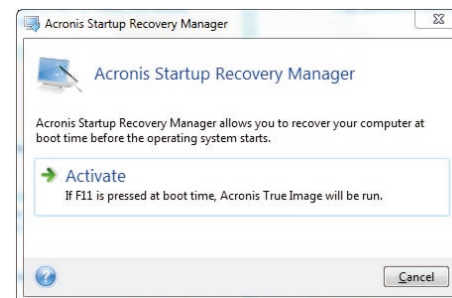


Figure 2: Acronis Startup Recovery Manager



Figure 3: The Information for Startup Recovery Manager

Step 3. Reboot your NET Series platform, and if the following prompt appears on your screen, it means the configuration for **Acronis Startup Recovery Manager** was successful.

Starting Acronis Loader...
Press F11 to run Acronis Startup Recovery Manager...

Backup Your NET Series System

When the installations and license activations of the necessary software in Windows are done, users can backup system image for the complete system. Once the system is backed up, users can always recover the operating system despite of any OS problem. This allows users to have a clean and complete backup image for your NET Series System.

The following steps show you how to back up system image with **Acronis Tools**.

Step 1. Double-click **Acronis** shortcut at desktop, and choose **Backup and recovery page**, then click **Back up data**.

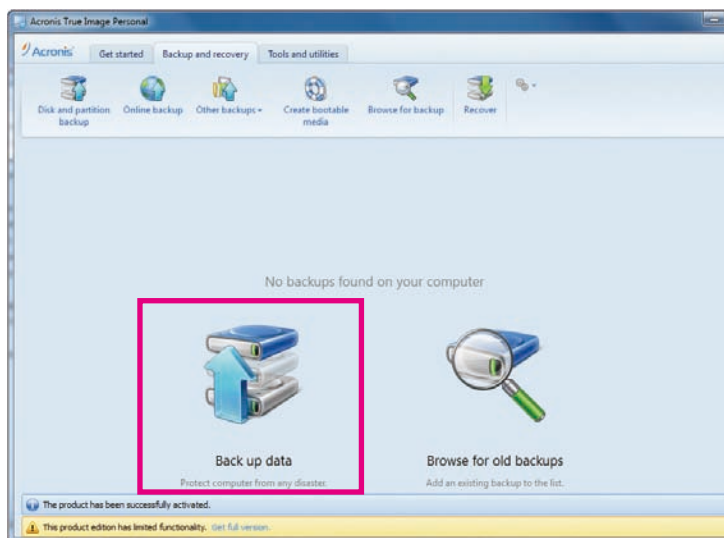


Figure 4. Backup and Recovery Page

Step 2. Back up the source to the **Acronis Secure Zone**, and name the backup file, then click **Back up now**.

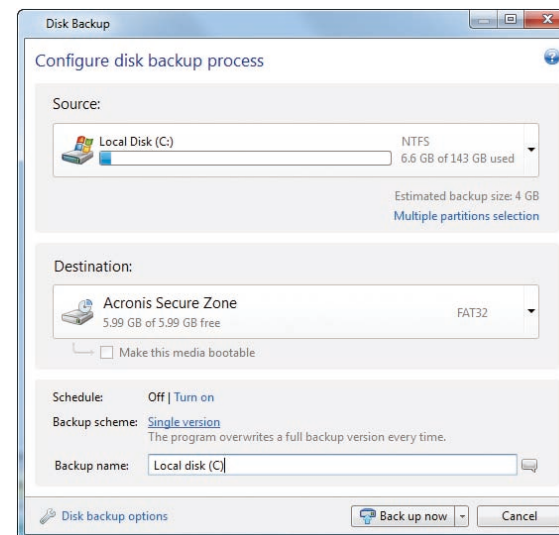


Figure 5. Disk Backup Page

Step 3. Wait for a few minutes, the backup file for your system will be created in the **Acronis Secure Zone**.

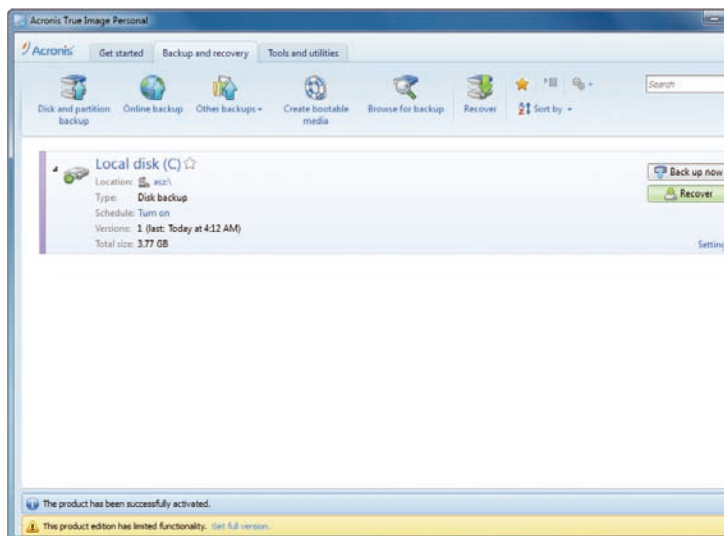


Figure 6. Back Up Complete

Note: You can adjust the size for **Acronis Secure Zone** by referring to the following steps.

Step 1. Choose **Tools and utilities** page then click **Acronis Secure Zone**.

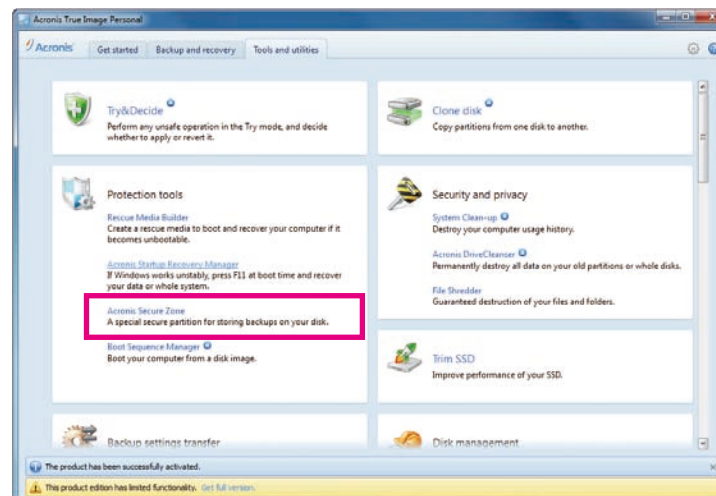


Figure 8. Adjust the Size for Acronis Secure Zone (1)

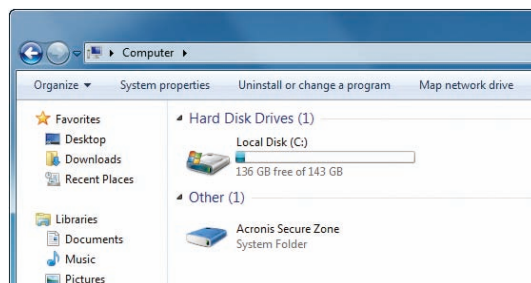


Figure 7. Acronis Secure Zone

Step 2. Choose a selection which you need, then you will see the adjustment selections after you click **Next >**.

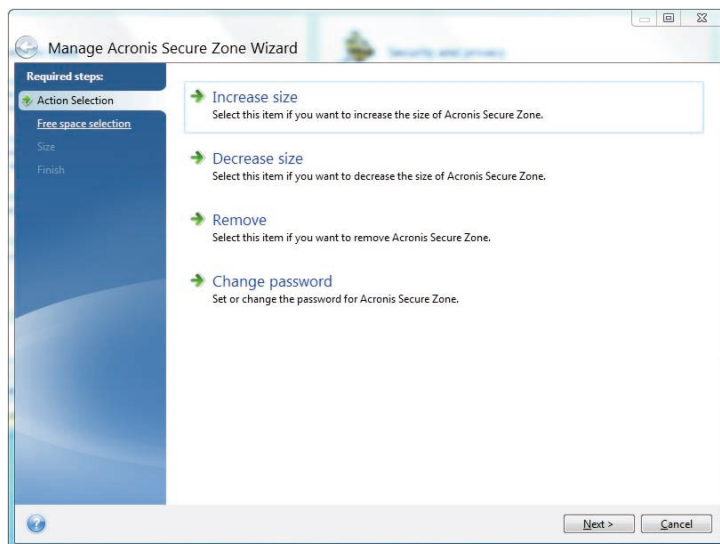


Figure 9. Adjust the Size for Acronis Secure Zone (2)

Step 3. Choose Disk 1: (C:), then you can adjust the size for **Acronis Secure Zone** (Figure 10), then click **Next >** to finish.

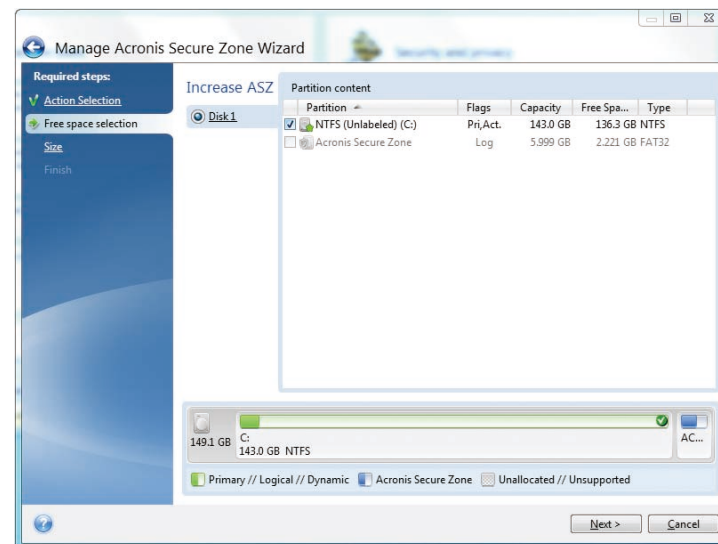


Figure 10. Adjust the Size for Acronis Secure Zone (3)

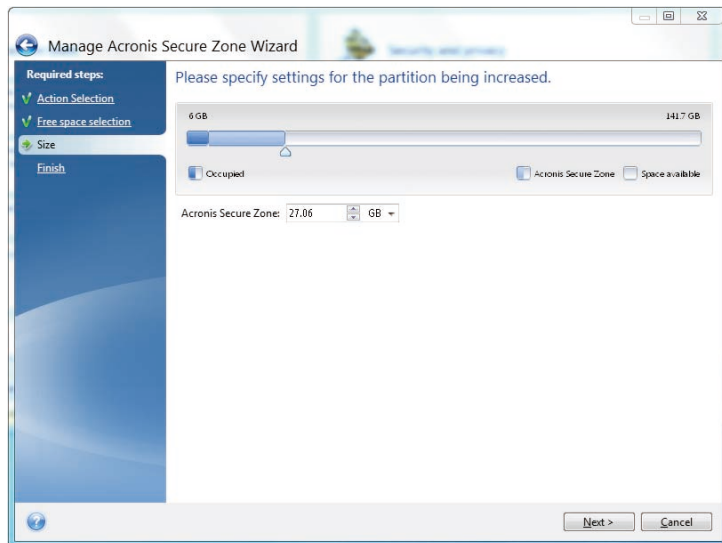


Figure 11. Adjust the Size for Acronis Secure Zone – Increase Size (4)

Recover Your NET Series System

This chapter shows you how to recover your system with **Acronis Startup Recovery Manager**. The prompt "**Press F11 for Acronis Startup Recovery Manager...**" will appear anytime you boot your system and you can simply hit the **F11** key on the keyboard to start the recovery process. The recovery function works even when the operating system fails.

The following steps will show you how to recover the system by using **Acronis Startup Recovery Manager**.

Step 1. Reboot the NET platform, when the following statement appears on your screen, hit **F11** immediately.

**Starting Acronis Loader...
Press F11 to run Acronis Startup Recovery Manager...**

Step 2. Enter the Linux kernel command line: **quiet** in the Boot menu, then click **OK**.

Step 3. After entering the **Acronis True Image Personal**, click **Acronis True Image**.

Step 4. Wait for initialization to finish and enter into the Home page, click **Recover**, then you will enter the **Recovery Wizard System**.

Step 5. In the **Recovery Wizard System**, you need to select the NET Series backup (which platform is used, e.g., NET3600...) in the Archive selection, then click the **Next >** button.

- Step 6. In the **Recovery method** page, choose **Recover whole disk and partitions**, then click the **Next >** button.
- Step 7. In the **What to recover** page, select NTFS(C:) in Disk 1, then click the **Next >** button.
- Step 8. In the **Specify settings of Partition C** page, the first part is **Partition location**, click **New location**, then choose NTFS(C:) and click **Accept**. The second part is **Partition Type**, click **Change default**, select Primary, then click **Accept**.
- Step 9. After completing Steps 1 to 8, you will see the **Summary** information in the **finish** page if those steps are set successfully. Click **Proceed** to start recovery.

CHAPTER 3: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers on the motherboard. Note that the following procedures are generic for NET 3500-ECM.

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 elec-

tronic 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:

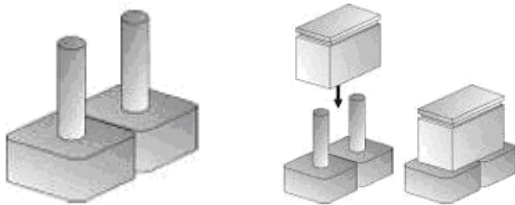
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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.

Jumper Settings

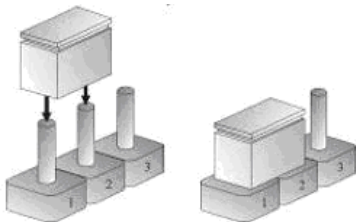
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on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



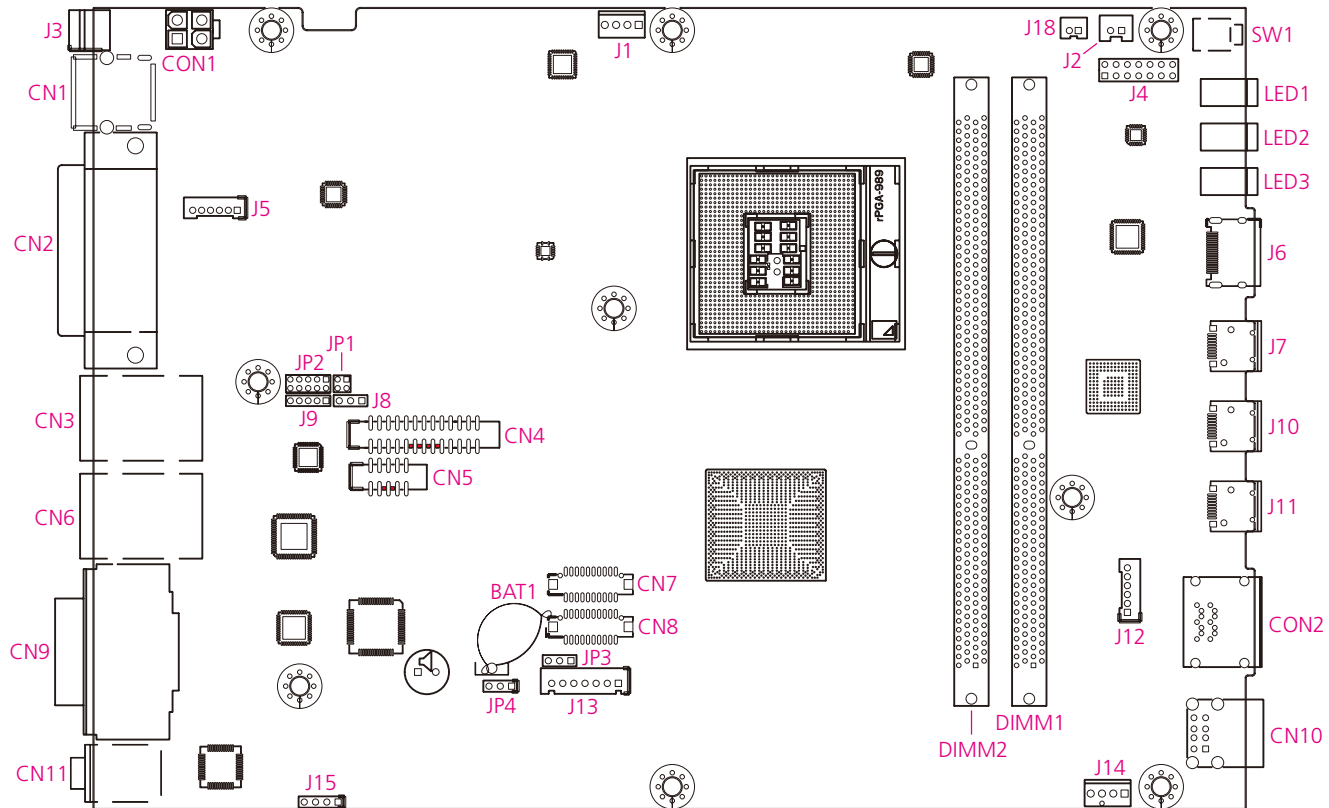
Three-Pin Jumpers: Pins 1 and 2 Are Short



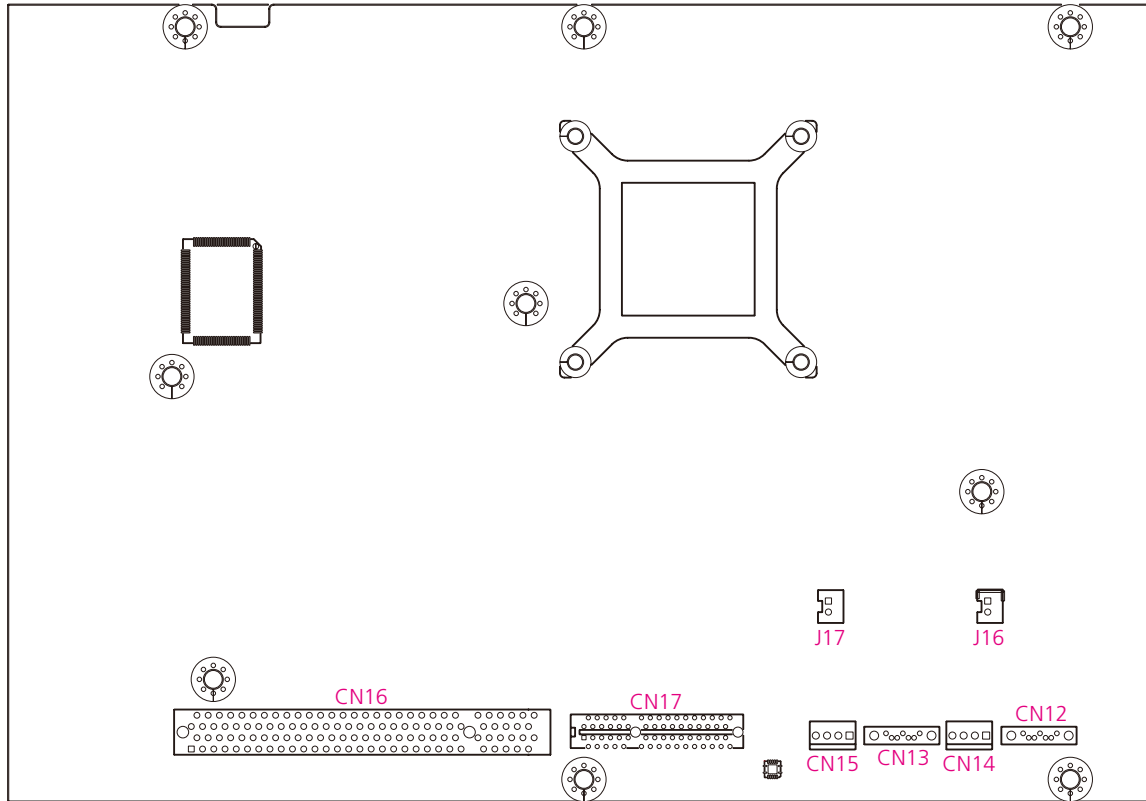
Locations of the Jumpers and Connectors

NISB 3500

The figure below is the top view of the NISB 3500 main board which is the main board used in the NET 3500-ECM system. It shows the locations of the jumpers and connectors.



The figure below is the bottom view of the NISB 3500 main board.



Jumpers

Clear CMOS

Connector size: 1x3 3-pin header, 2.54 mm pitch

Connector location: JP4

1  3

Pin	Settings
1-2 On	*Normal
2-3 On	CMOS Clear

1-2 On: default

Pin	Definition
1	RTCRST#_PU
2	RTCRST#
3	CLR_CMOS

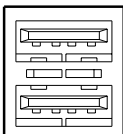
Connector Pin Definitions

External I/O Interface - Front Panel

USB Ports

Connector type: Dual USB port

Connector location: CN10

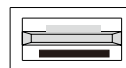


Pin	Definition	Pin	Definition
1	+5V	7	USB1+
2	USB0-	8	GND
3	USB0+	22	GND
4	GND	23	GND
5	+5V	26	GND
6	USB1-	27	GND

eSATA Ports

Connector type: eSATA port

Connector location: CON2A and CON2B



Pin	Definition	Pin	Definition
1	GND	5	SATA_RXN4
2	SATA_TXP4	6	SATA_RXP4
3	SATA_TXN4	7	GND
4	GND		

Status Indicators

PWR



HDD

Status	LED Color
PWR	Green
HDD	Yellow

LAN1/LAN2 Link/Active LED

Connector location: LED1 and LED2

LINK1



LINK2



ACT1

ACT2

Pin	Definition
C1	LAN2_LINK_N
C2	LAN2_ACT_N
A1	LAN2_LINK_P
A2	LAN2_ACT_P



ATX Power On/Off Switch

Connector location: SW1



Pin	Definition
On	Blue light
Off	Red light

Pin	Definition	Pin	Definition
1	GND	2	PBT_PU
3	PBT_PU	4	GND
A1	PWRLED_N	C1	PWRLED_P

External I/O Interface - Rear Panel

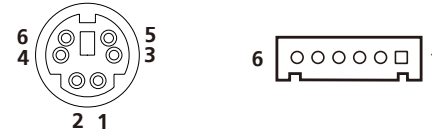
Connector type: 2-pin switch
 Connector location: J3



Pin	Definition
1	GND
2	PBT_PU

PS/2 Keyboard/Mouse Port

Connector type: PS/2, Mini-DIN-6, JST-2.0mm-M-180
 Connector location: J5

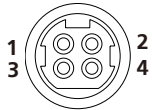


Pin	Definition	Pin	Definition
1	5VSB	2	KDAT
3	KCLK	4	MDAT
5	MCLK	6	GND

9V-30V DC Input

Connector type: POWER-F-90

Connector location: CN1



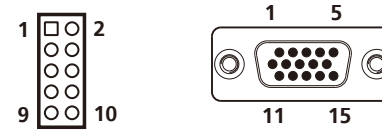
Pin	Definition	Pin	Definition
1	VIN	2	VIN
3	GND	4	GND
5	GND		

GPIO Connector

(4 digital input and 4 digital output)

Connector type: DB-15 port, 2x5 10-pin header, 2.0 mm-M-180

Connector location: JP2

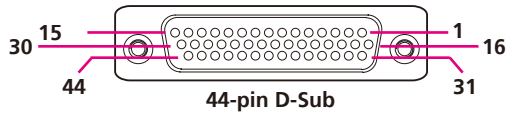


Pin	Definition	Pin	Definition
1	VCC5	2	SIO_GPI20
3	SIO_GPI21	4	SIO_GPI22
5	SIO_GPI23	6	GND
7	SIO_GPO24	8	SIO_GPO25
9	SIO_GPO26	10	SIO_GPO27

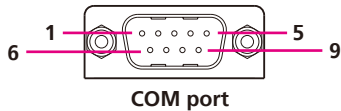
Serial Interface (COM 1 - COM 4)

Connector type: 44-pin D-Sub, 2x22 (12.55mm x 53.04mm)

Connector location: CN4



The 44-pin D-Sub connector is used to connect 4 external serial devices. Use the COM ports on the provided “DB44 to 4x DB9 COM port cable” (included in the package) to connect the devices.



Pin	Definition	Pin	Definition
1	CN10_1	2	CN10_2
3	CN10_3	4	CN10_4
5	GND	6	CN10_6
7	CN10_7	8	CN10_8
9	CN10_9	10	GND
11	CN10_11	12	CN10_12
13	CN10_13	14	CN10_14
15	GND	16	CN10_16
17	CN10_17	18	CN10_18
19	CN10_19	20	GND
21	CN10_21	22	CN10_22
23	CN10_23	24	CN10_24
25	GND	26	CN10_26
27	CN10_27	28	CN10_28
29	CN10_29	30	GND
31	CN10_31	32	CN10_32
33	CN10_33	34	CN10_34
35	GND	36	CN10_36
37	CN10_37	38	CN10_38
39	SP4_RI_TI	40	GND
41	NC	42	NC
43	NC	44	NC

COM1 (RS232) labelled "A" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
1	1	DCD1	2	2	RXD1
3	3	TXD1	4	4	DTR1
5	5	GND	6	6	DSR1
7	7	RTS1	8	8	CTS1
9	9	RI1	10		GND

COM4 labelled "D" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
31	1	DCD4	32	2	RXD1
33	3	TXD4	34	4	DTR1
35	5	GND	36	6	DSR1
37	7	RTS4	38	8	CTS1
39	9	RI4	40		GND

COM2 (RS232) labelled "B" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
11	1	DCD2	12	2	RXD2
13	3	TXD2	14	4	DTR2
15	5	GND	16	6	DSR2
17	7	RTS2	18	8	CTS2
19	9	RI2	20		GND

Note: Pin 39 is defined as an external power source, which can be selected for 5V or 12V using JP9.

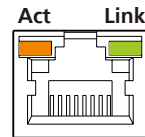
COM2 (RS422) labelled "B" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
11	1	TXD-	12	2	TXD+
13	3	RXD+	14	4	RXD-
15	5	GND	16	6	RTS-
17	7	RTS#	18	8	CTS+
19	9	CTS-	20		GND

COM3 (RS232) labelled "C" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
21	1	DCD3	22	2	RXD3
23	3	TXD3	24	4	DTR3
25	5	GND	26	6	DSR3
27	7	RTS3	28	8	CTS3
29	9	RI3	30		GND

COM2 (RS485) labelled "B" on DB9 Cable Connector					
DB44 Pin #	DB9 Pin #	Def.	DB44 Pin #	DB9 Pin #	Def.
11	1	TXD-	12	2	TXD+
		RXD-			RXD+
13	3	Reserved	14	4	Reserved
15	5	Reserved	16	6	Reserved
17	7	Reserved	18	8	Reserved
19	9	Reserved	20		Reserved

LAN Ports

Connector type: RJ45 port with LEDs
 Connector location: CN3B and CN6B



Act	Status
Orange	Data Activity
Blinking	
Off	No Activity

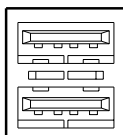
Link	Status
Green	Linked
Always Lighted	
Off	No Link

Pin	Definition	Pin	Definition
09	LAN1_M0P	10	LAN1_MON
11	LAN1_M1P	12	LAN1_M2P
13	LAN1_M2N	14	LAN1_M1N
15	LAN1_M3P	16	LAN1_M3N
17	LAN1_LED1P	18	LAN1_LED_ACT#
19	LAN1_LED2P	20	LAN1_LINK#
21	GND	24	GND
25	GND	28	GND

USB Ports

Connector type: Dual USB port

Connector location: CN3A and CN6A

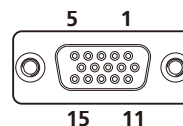


Pin	Definition	Pin	Definition
1	+5V	7	USB1+
2	USB0-	8	GND
3	USB0+	22	GND
4	GND	23	GND
5	+5V	26	GND
6	USB1-	27	GND

VGA Port

Connector type: DB-15 port, 15-pin D-Sub

Connector location: CN9B

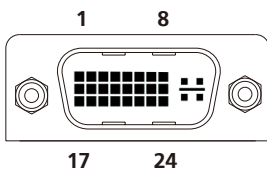


Pin	Description	Pin	Description	Pin	Description
1	RED_VGA	2	GREEN_VGA	3	BLUE_VGA
4	DVI_GND	5	DVI_GND	6	DVI_GND
7	DVI_GND	8	DVI_GND	9	VGA_+5V
10	DVI_GND	11	DVI_GND	12	DATA_V
13	HS_VGA	14	VS_VGA	15	CLK_V
MH3	DVI_GND	MH4	DVI_GND		

DVI-I Port

Connector type: 29-pin D-Sub Female 90°

Connector location: CN9A

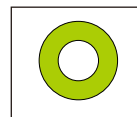


Pin	Function	Pin	Function
01	HDMI_DATA2_N	2	HDMI_DATA2_P
03	DVI_GND	4	NC
05	NC	6	HDMI_CTL_CLK
07	HDMI_CTL_SDA	8	DC_VSYNC_VGA
09	HDMI_DATA1_N	10	HDMI_DATA1_P
11	DVI_GND	12	NC
13	NC	14	HDMIC_PWR_S
15	DVI_GND	16	HDMIC_HPDET
17	HDMI_DATA0_N	18	HDMI_DATA0_P
19	DVI_GND	20	DC_DATA_VGA
21	DC_CLK_VGA	22	NC
23	HDMI_LKP	24	HDMI_LKN
C1	DC_RED_VGA	C2	DC_GREEN_VGA
C3	DC_BLUE_VGA	C4	DC_HSYNC_VGA
C5A	DVI_GND	C5B	DVI_GND

Speaker-out Jack

Connector type: 5-pin jack

Connector location: CN11B

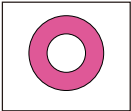


Pin	Definition
1	GND
2	SPK_Out_R
3	NC
4	NC
5	SPK_Out_L

Mic-in Jack

Connector size: 5-pin jack, 25.9x12.6x17.0mm

Connector location: CN11A



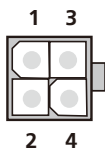
Pin	Definition
1	AU_GND
2	MIC_OUT-L
3	AU_GND
4	MIC_JD1
5	MIC_OUT-R

Internal Connectors

DC Power Output Connector

Connector type: 2x2 Aux power connector

Connector location: CON1



Pin	Definition
1	GND
2	GND
3	VIN
4	VIN

Reset Connector

Connector type: 1x2 2-pin header, JST 2.5mm-M-90

Connector location: J2



Pin	Definition
1	RESET#
2	GND

SMBus DATA/CLK Pin Header

Connector type: 1x3 3-pin header 2.54mm-M-180

Connector location: J8



Pin	Definition
1	SMB_CLK
2	SMB_DATA
3	GND

LVDS Backlight Power Select

Connector type: 1x3 3-pin header 2.54mm-M-180

Connector location: JP3



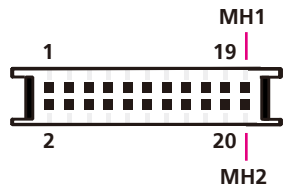
Pin	Definition
1	VCC5
2	PANEL1_VDD
3	VCC3

*Default: 2-3

LVDS Channel A Connector

Connector type: LCD-1.25mm-M-180

Connector location: CN7

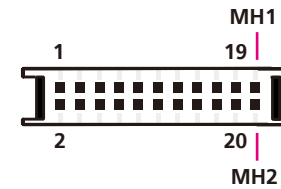


Pin	Definition	Pin	Definition
1	L_DDC_CLK	2	L_DDC_DATA
3	VDD	4	LA_DATAP0
5	LA_DATAP3	6	LA_DATAN0
7	LA_DATAN3	8	VDD
9	GND_LVDS	10	LA_DATAP1
11	LA_CLKP	12	LA_DATAN1
13	LA_CLKN	14	GND_LVDS
15	GND_LVDS	16	PANEL1_BACKLIGHT
17	LA_DATAP2	18	PANEL1_BACKLIGHT
19	LA_DATAN2	20	GND_LVDS

LVDS Channel B Connector

Connector type: LCD-1.25mm-M-180

Connector location: CN8



Pin	Definition	Pin	Definition
1	L_DDC_CLK	2	L_DDC_DATA
3	VDD	4	LB_DATAP0
5	LB_DATAP3	6	LB_DATAN0
7	LB_DATAN3	8	VDD
9	GND_LVDS	10	LB_DATAP1
11	LB_CLKP	12	LB_DATAN1
13	LB_CLKN	14	GND_LVDS
15	GND_LVDS	16	PANEL1_BACKLIGHT
17	LB_DATAP2	18	PANEL1_BACKLIGHT
19	LB_DATAN2	20	GND_LVDS

LVDS Backlight Connector

Connector type: 1x7 7-pin header JST-2.5mm-M-180

Connector location: J13



Pin	Definition
1	VCC5
2	PANEL1_BACKLIGHT
3	PANEL1_BACKLIGHT
4	L_BKLTCTL_R
5	GND
6	GND
7	L_BKLTEN

SATA Ports

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)

Connector location: CN12 and CN13

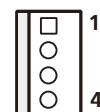


Pin	Definition
1	GND
2	SATA_TXP1
3	SATA_TXN1
4	GND
5	SATA_RXN1
6	SATA_RXP1
7	GND

SATA Power Connectors

Connector type: 4-pin Wafer, 2.54mm-M-180

Connector location: CN14 and CN15



Pin	Definition
1	+12V
2	GND
3	GND
4	VCC5

SATA DOM Power Connectors

Connector type: 1x2 2-pin JST wafer, 2.54mm pitch

Connector location: J16 and J17

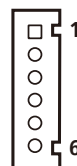


Pin	Definition
1	+12V
2	GND

USB Port Connector

Connector type: 6-pin boxed header, JST-2.0mm-M-180

Connector location: J12



Pin	Definition
1	+5V
2	USB10-
3	USB10+
4	USB11-
5	USB11+
6	GND

COM4 RI Pin Header

Connector type: 1x5 5-pin header 2.0mm -M-180

Connector location: J9



Pin	Definition
1	VCC5
2	SP4_RI_T
3	+12V
4	SP4_RI_T
5	SP4_R

*Default: 4-5

GPIO LED Connector

Connector type: 2x2 4-pin 2.0mm -M-180

Connector location: JP1



Pin	Definition
1	GPO_LED0
2	GND
3	GPO_LED1
4	GND

Line-in Connector

Connector type: 1x4 4-pin header 2.5mm-M-180

Connector location: J15

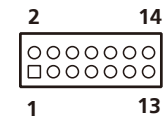


Pin	Definition
1	LINE1-LP
2	GND
3	LINE1-JD
4	LINE1-RP

Internal Power/HDD/LAN Power/LAN Active LED

Connector type: 2x7 14-pin header 2.54mm-M-180

Connector location: J4

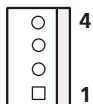


Pin	Description	Pin	Description
1	LED_PWRN	2	LED_PWRP
3	HD_LEDN	4	LED_HDDP
5	LAN1_LINK#	6	LAN1_LINKP
7	LAN1_LED_ACT#	8	LAN1_ACTP
9	LAN2_LINK#	10	LAN2_LINKP
11	LAN2_LED_ACT#	12	LAN2_ACTP
13	NC	14	NC

Smart Fan Connectors

Connector size: 4-pin Wafer, 2.54mm-M-180

Connector location: J1 and J14



Pin	Definition
1	GND
2	+12V
3	CPUFANIN_P
4	CPUFANOUT_R

COM5 Connector

Connector type: 2x5 10-pin boxed header, 2.0mm-M-180

Connector location: CN5



Pin	Definition	Pin	Definition
1	SP5_DCD	2	SP5_RXD
3	SP5_TXD	4	SP5_DTR
5	GND	6	SP5_DSR
7	SP5_RTS	8	SP5_CTS
9	SP5_RI	10	GND

Parallel Connector

Connector size: 2x13 26-pin box header, 2.0mm-M-180

Connector location: CN4



Pin	Definition	Pin	Definition
1	LPT_RP_STB#	14	LPT_AFD#R
2	LPT_RP_PRD0	15	LPT_ERR#
3	LPT_RP_PRD1	16	LPT_INIT#R
4	LPT_RP_PRD2	17	LPT_SLIN#R
5	LPT_RP_PRD3	18	GND_LPT
6	LPT_RP_PRD4	19	GND_LPT
7	LPT_RP_PRD5	20	GND_LPT
8	LPT_RP_PRD6	21	GND_LPT
9	LPT_RP_PRD7	22	GND_LPT
10	LPT_ACK#R	23	GND_LPT
11	LPT_BUSY	24	GND_LPT
12	LPT_PE	25	GND_LPT
13	LPT_SLCT	26	NC

CHAPTER 4: HARDWARE INSTALLATION

Removing the Chassis Cover



Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. The screws on the cover are used to secure the cover to the chassis.
2. Remove these screws and then put them in a safe place for later use.



The dots denote the locations of the screws.

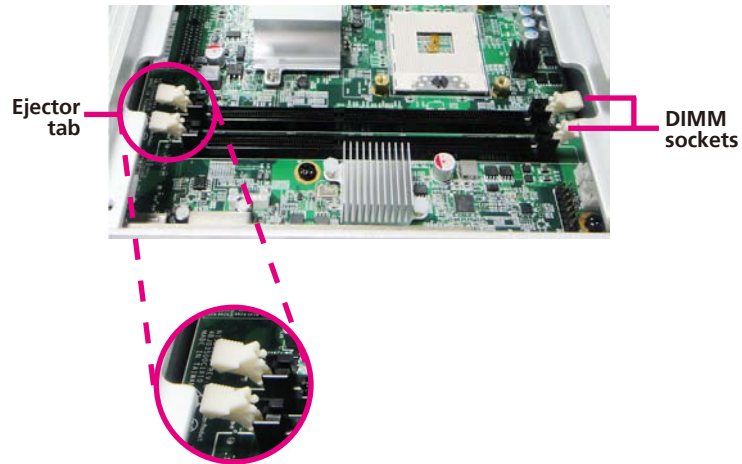
3. Lift up the cover and then remove it from the chassis.



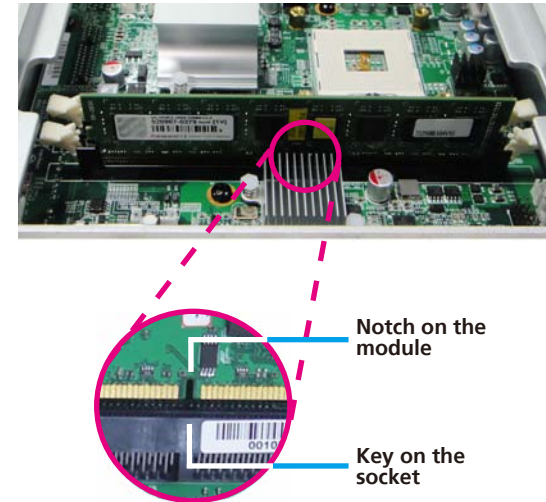
4. Battery: One removable lithium BR2032 is pre-installed in NET 3500-ECM. (CAUTION: Risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.)
5. Optional Power adapter: Suggest to use an appropriate AC/DC power adapter compliant with CE or UL safety regulations.

Installing a DIMM

1. Push the ejector tabs which are at the ends of the socket outward. This indicates that the socket is unlocked.



2. Note how the module is keyed to the socket. Grasping the module by its edges, align the module with the socket so that the “notch” on the module is aligned with the “key” on the socket. The key ensures the module can be plugged into the socket in only one direction.

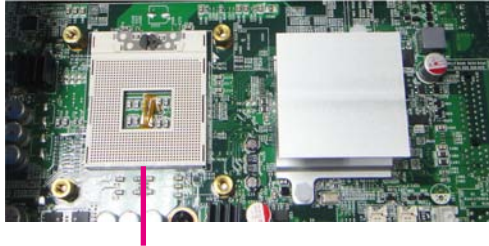


3. Seat the module vertically, pressing it down firmly until it is completely seated in the socket. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



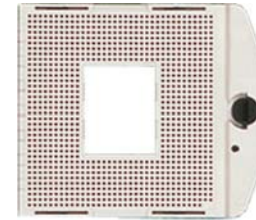
Installing the CPU

1. The CPU socket is readily accessible after you have removed the chassis cover.



CPU socket

2. Make sure the screw is in its unlock position. If it's not, use a screwdriver to turn the screw to its unlock position.

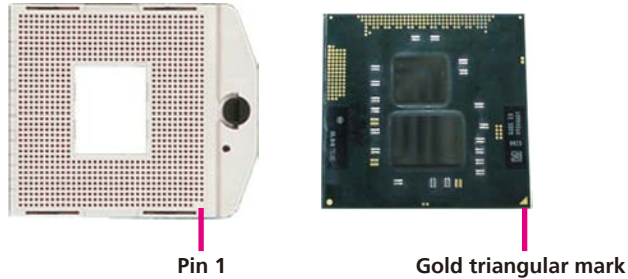


Screw in unlocked position



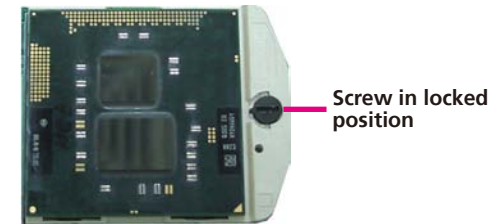
- Make sure all power cables are unplugged before you install the CPU.
- The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure.

- Position the CPU above the socket. The gold triangular mark on the CPU must align with pin 1 of the CPU socket.



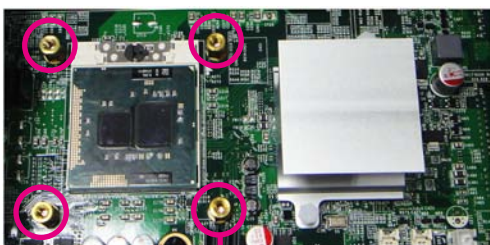
-  Handle the CPU by its edges and avoid touching the pins.

- Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force. Use a screwdriver to turn the screw to its lock position.



- Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.

5. Before you install the heat sink, apply thermal paste onto the top of the CPU. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.
6. Align the mounting holes of the heat sink with the mounting studs on the board and then secure the heat sink with the provided screws.



Mounting stud

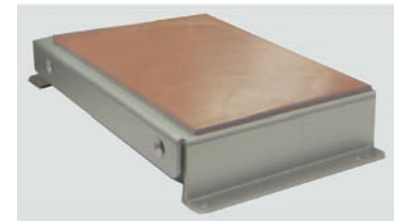
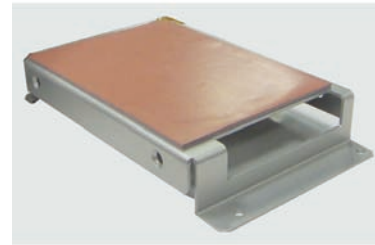
Installing a SATA Hard Drive

1. With the bottom side of the chassis facing up, remove the screws of the bottom cover.
2. Remove the 4 mounting screws that secure the drive bay to the chassis.



If you are installing one SATA drive only, the system will allow you to install an optional CompactFlash card, a half length SATA DOM or a full length SATA DOM.

3. Remove the drive bay. The drive bay is used to hold a SATA hard drive.

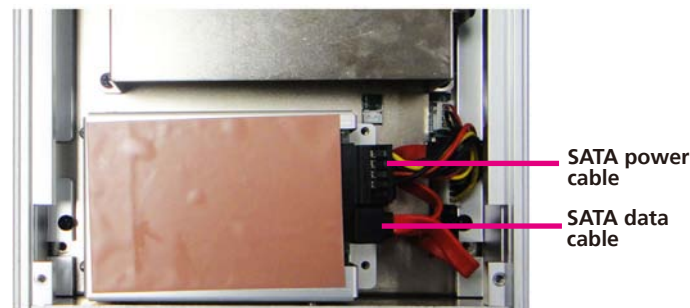


4. Place the SATA hard drive on the drive bay. Make sure the connector side of the SATA drive is facing the opening of the drive bay.
5. Align the mounting holes that are on the sides of the SATA drive with the mounting holes on the drive bay then use the provided mounting screws to secure the drive in place.

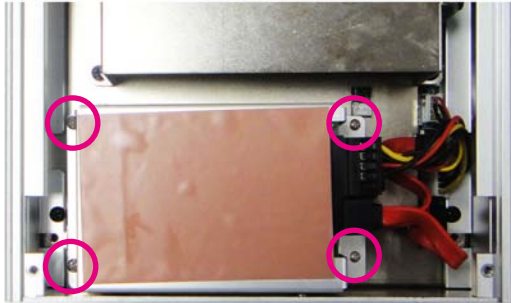


Connector side of the SATA drive

6. Connect the SATA data cable and SATA power cable to the connectors on the SATA drive.



7. Use the provided mounting screws to secure the drive bay to the chassis.

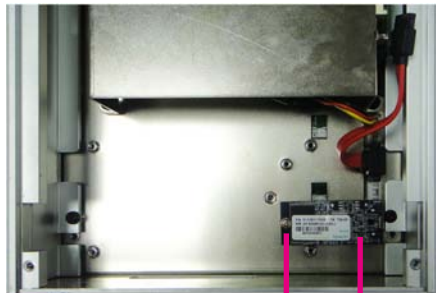


Installing a Full Length SATA DOM



If you intend to install a full length SATA DOM, you may install one SATA hard drive only.

1. Prior to installing the full length SATA DOM, remove any drive bay that may have been previously installed.
2. Locate for the SATA connector on the board.
3. Align the SATA connector located on the solder side of the SATA DOM to the SATA connector that is on the board and then press it down firmly. Secure the SATA DOM with the provided mounting screw.



Mounting screw
SATA DOM

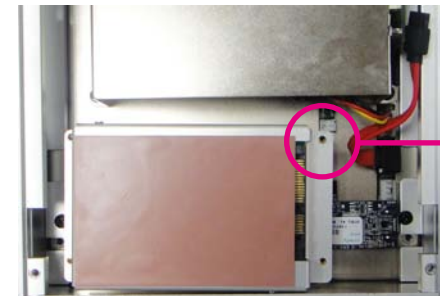


Solder side of
SATA DOM

SATA connector

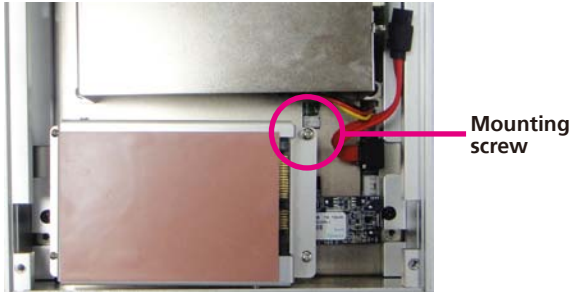
4. Before installing the single drive bay back, you must first replace the 4 mounting studs.

Now place the single drive bay by aligning the mounting holes of the drive bay with the mounting studs.



Mounting
hole

5. Secure the drive bay with the provided mounting screws.

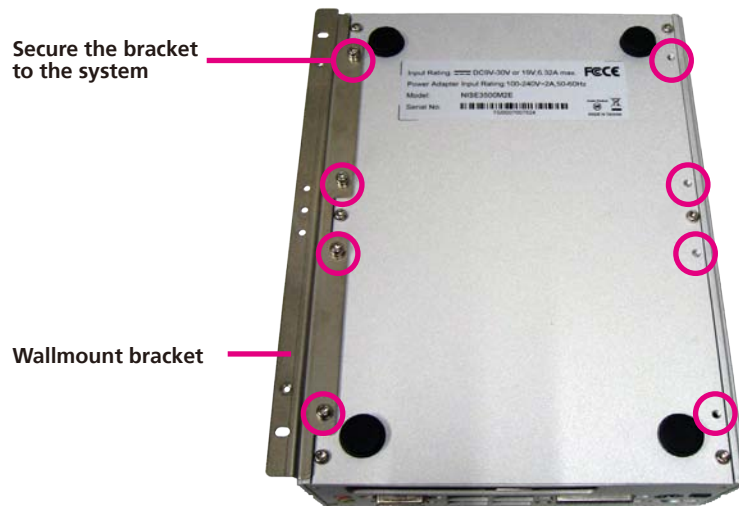


Wallmount Brackets

The wallmount brackets provide a convenient and economical way of mounting the system on the wall.

1. The mounting holes are located at the bottom of the system. Secure the brackets on each side of the system using the provided mounting screws.

2. Now mount the system on the wall by fastening screws through the bracket's mounting holes.



APPENDIX A: BIOS SETUP

This chapter describes how to use the BIOS setup program for NET 3500-ECM. 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 website 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.

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 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 submenu.

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>.

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 six setup functions and one exit choices. 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 SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
BIOS Information		American Megatrends		Use [ENTER], [TAB] or [SHIFT-TAB] to select a field. Use [+] or [-] to configure system Time.		
BIOS Vendor		4.6.3.7				
Core Version		N350-010 x64				
Project Version		07/28/2010 16:52:57				
Build Date						
Memory Information						
Total Memory		1024 MB (DDR3 1066)				
System Date		[Wed 08/11/2010]				
System Time		[16:51:35]				
Access Level		Administrator				
				→ ←: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit		
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.						

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

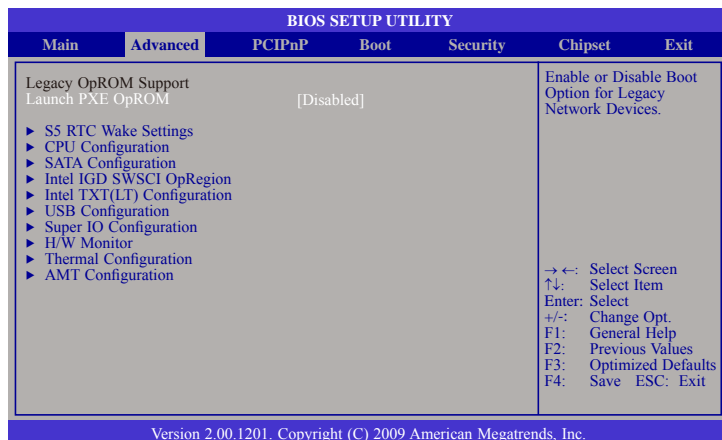
The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

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.

S5 RTC Wake Settings

Configures the S5 RTC wake up setting.

CPU Configuration

This section is used to configure the CPU. It will also display detected CPU information.

SATA Configuration

This section is used to configure the SATA drives.

Intel IGD SWSCI OpRegion

Configures the Intel graphics display.

Intel TXT(LT) Configuration

Configures the Intel Trusted Execution technology.

USB Configuration

Configures the USB devices.

Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.

H/W Monitor

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

Thermal Configuration

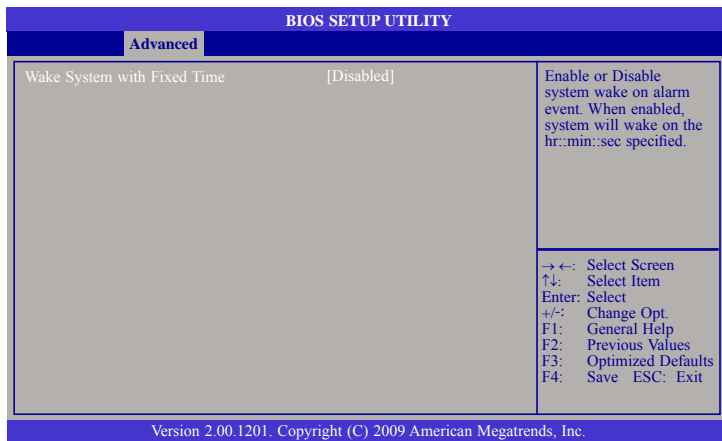
Configures the intelligent power sharing function.

AMT Configuration

Configures the AMT function.

S5 RTC Wake Settings

This section is used to configure the wake up function.

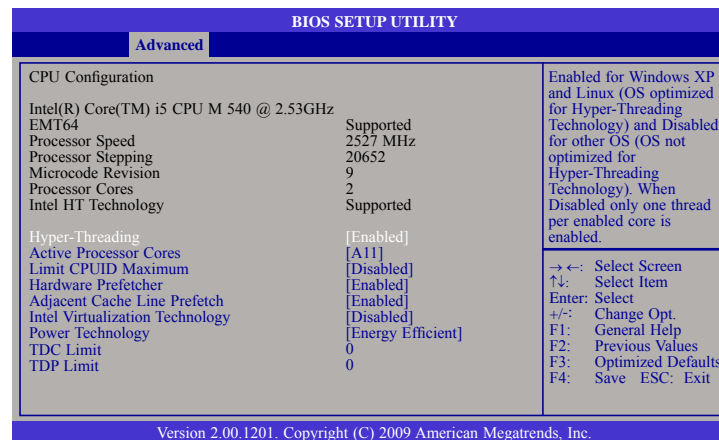


Wake System with Fixed Time

Enables or disables the system's wake on alarm event. When enabled, the system will wake up on the specified time.

CPU Configuration

This section is used to configure the CPU. It will also display detected CPU information.



Hyper-Threading

Enable this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

Active Processor Cores

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.

Hardware Prefetcher

Turns on or off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

Enables or disables the adjacent cache line prefetch.

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.

TDC Limit

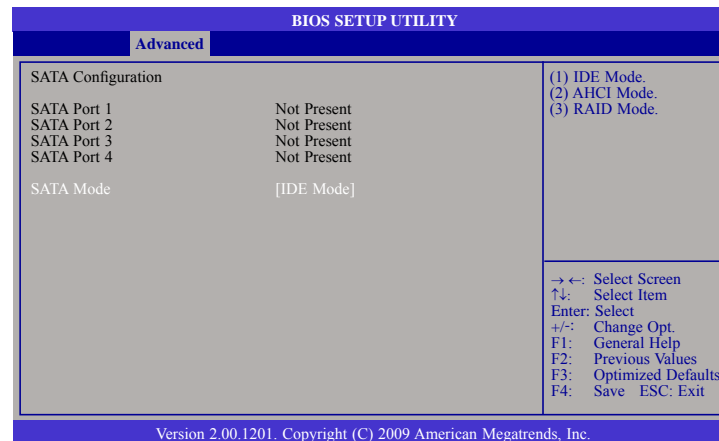
Used to select the TDC limit.

TDP Limit

Used to select the TDP limit.

SATA Configuration

This section is used to configure the SATA drives.

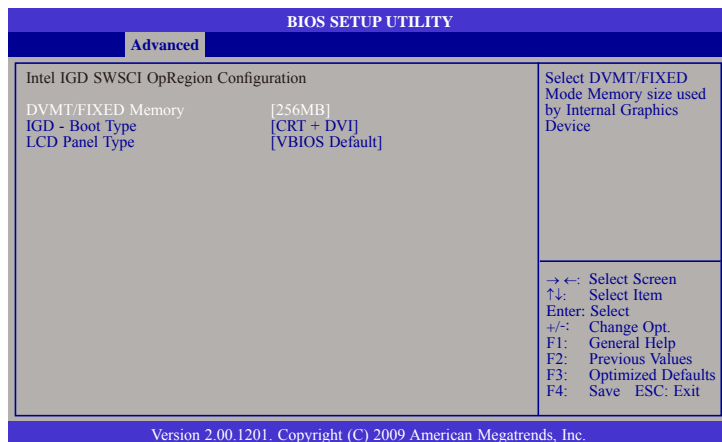


SATA Mode

- IDE Mode** This option configures the Serial ATA drives as Parallel ATA storage devices.
- AHCI Mode** This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).
- RAID Mode** This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

Intel IGD SWSCI OpRegion

This section is used to configure the Intel graphics display.



DVMT/FIXED Memory

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

IGD - Boot Type

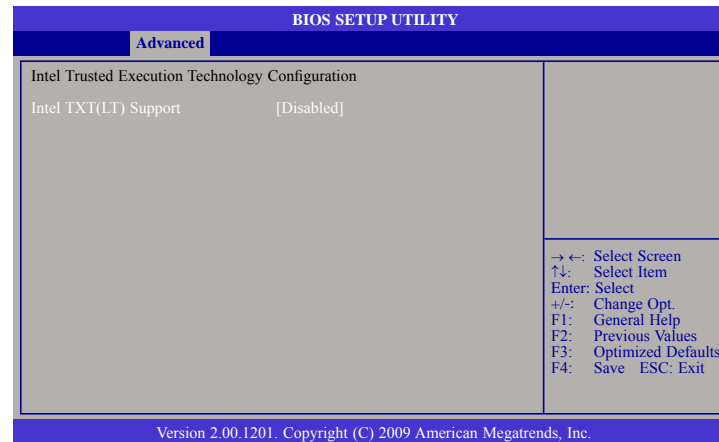
Selects the video device that will be activated during POST. This will not affect any external graphics that may be present.

LCD Panel Type

Selects the LCD panel used by the internal graphics device.

Intel TXT(LT) Configuration

This section is used to configure the Intel Trusted Execution technology.

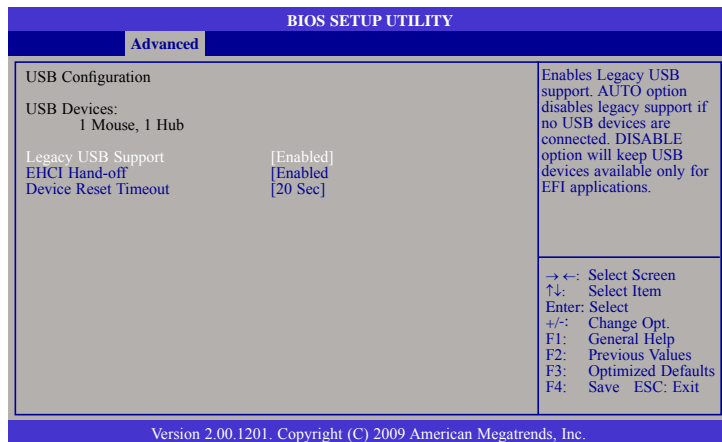


Intel TXT(LT) Support

The options are Enabled and Disabled.

USB Configuration

This section is used to configure USB devices.



Legacy USB Support

Enabled Enables legacy USB.

Auto Disables support for legacy when no USB devices are connected.

Disabled Keeps USB devices available only for EFI applications.

EHCI Hand-off

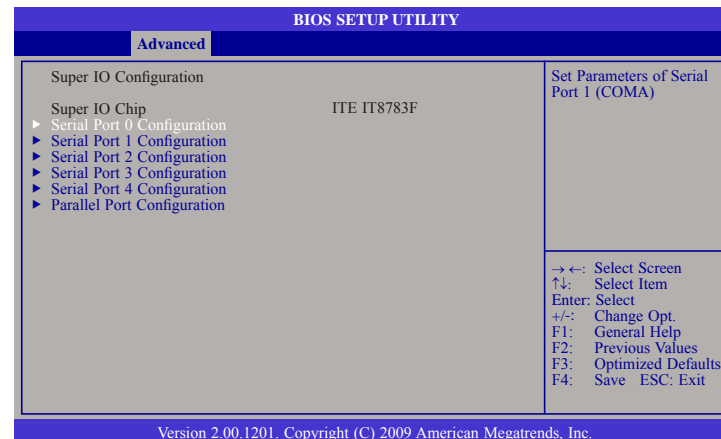
This is a workaround for OSeS that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

Device Reset Timeout

Selects the USB mass storage device start unit command timeout.

Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.



Serial Port 0 Configuration to Serial Port 4 Configuration

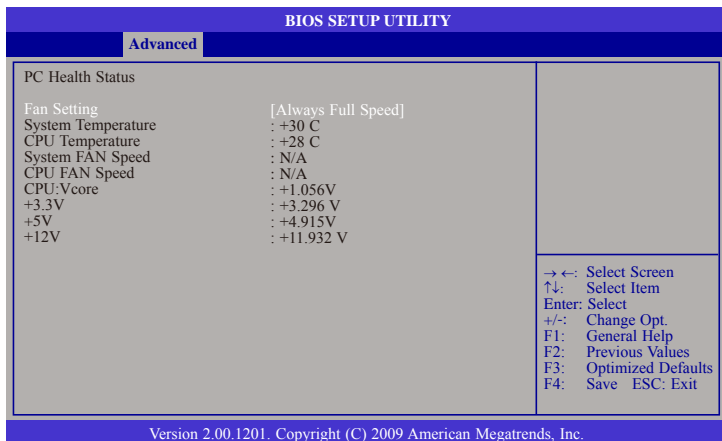
Selects the IO/IRQ setting of the I/O devices.

Parallel Port Configuration

Configures the parallel port.

H/W Monitor

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



Fan Setting

Selects the speed of the fan.

System Temperature and CPU Temperature

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

System Fan Speed to CPU Fan Speed

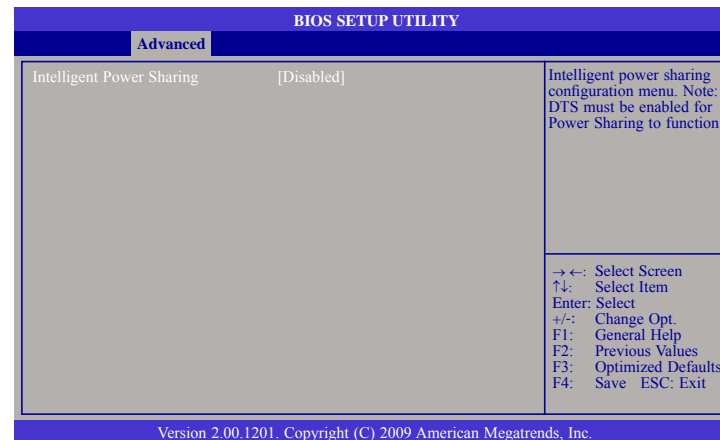
Detects and displays the current system fan and CPU fan speed in RPM (Revolutions Per Minute).

CPU:Vcore to +12V

Detects and displays the output voltages.

Thermal Configuration

This section is used to configure the intelligent power sharing function.

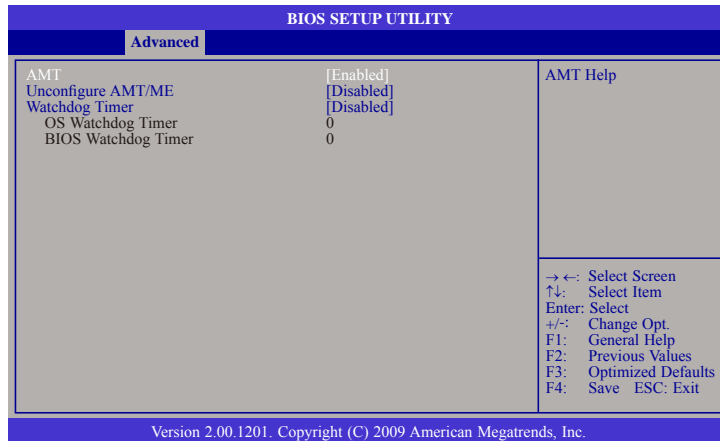


Intelligent Power Sharing

Enables or disables the power sharing function.

AMT Configuration

This section is used to configure the AMT function.



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.

Chipset

This section is used to configure the system based on the specific features of the chipset.



Setting incorrect field values may cause the system to malfunction.

North Bridge

BIOS SETUP UTILITY	
Chipset	
CPU Type	Arrandale
Total Memory	1024 MB (DDR3 1066)
Memory Slot 0	1024 MB (DDR3 1066)
Memory Slot 1	0 MB (DDR3 1066)
CAS# Latency (tCL)	7
RAS# Active Time (tRAS)	20
Row Precharge Time (tRP)	7
RAS# to CAS# Delay (tRCD)	7
Write Recovery Time (tWR)	8
Row Refresh Cycle Time (tRFC)	60
Write to Read Delay (tWTR)	4
Active to Active Delay (tRRD)	4
Read CAS# Precharge (tRTP)	5
Initiate Graphic Adapter	[PEG/IGD]
VT-d	[Disabled]
IGD Memory	[32M]

→ ←: Select Screen
 ↑ ↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save ESC: Exit

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Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

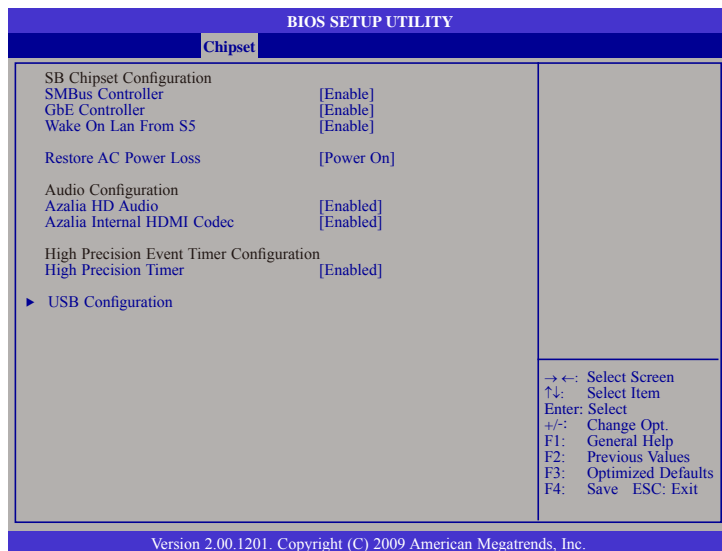
VT-d

The options are Enabled and Disabled.

IGD Memory

Selects the internal graphics device's shared memory size.

South Bridge



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

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.

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

Azalia HD Audio

Enables or disables the Azalia HD audio.

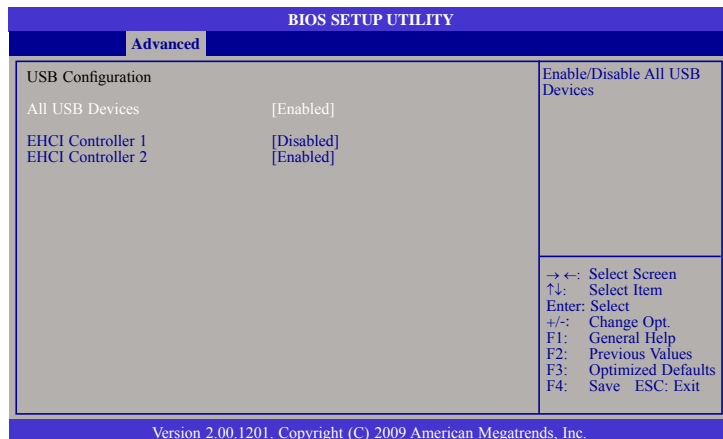
Azalia Internal HDMI Codec

Enables or disables the Azalia internal HDMI codec.

High Precision Timer

Enables or disables the high precision event timer.

USB Configuration



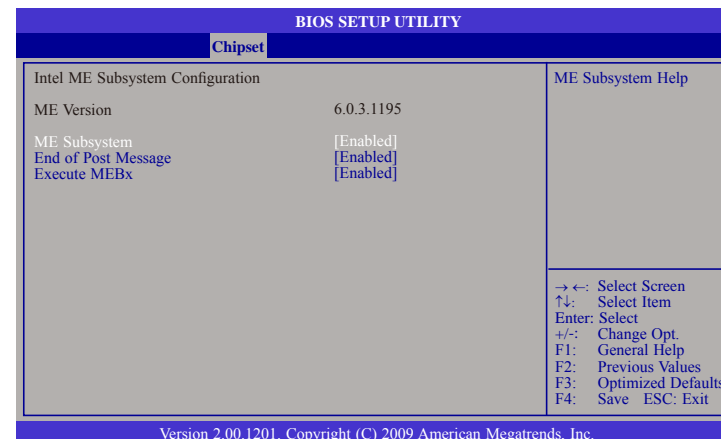
All USB Devices

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.

End of the POST Message

The options are Enabled and Disabled.

Execute MEBx

The options are Enabled and Disabled.

Boot

BIOS SETUP UTILITY					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Configuration					Enables/Disables Quiet Boot option
Quiet Boot			[Disabled]		
Fast Boot			[Disabled]		
Setup Prompt Timeout			1		
Bootup NumLock State			[On]		
CSM16 Module Version			07.60		
GateA20 Active			[Upon Request]		
Option ROM Messages			[Force BIOS]		
Interrupt 19 Capture			[Disabled]		
Boot Option Priorities					← →: Select Screen
Boot Option #1			[SATA: FUJITSU MH...]		↑ ↓: Select Item
Boot Option #2			[Built-in EFI Shell]		Enter: Select
Hard Drive BBS Priorities					+/-: Change Opt.
					F1: General Help
					F2: Previous Values
					F3: Optimized Defaults
					F4: Save ESC: Exit

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Quiet Boot

Enables or disables the quiet boot function.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. This doesn't affect the BBS boot options.

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.

Gate A20 Active

Configures the Gate A20 function.

Option ROM Messages

Configures the ROM messages.

Interrupt 19 Capture

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

Boot Option #1 and Boot Option #2

Selects the boot sequence of the hard drives.

Hard Drive BBS Priorities

Sets the order of the legacy devices in this group.

Security

BIOS SETUP UTILITY					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Password Description If only the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If only the User's password is set, then this is a power on password and must be entered to boot or enter setup. In Setup the User will have Administrator rights.			Set Setup Administrator Password.		
Administrator Password User Password			→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit		
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.					

Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit

BIOS SETUP UTILITY					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset				Reset the system after saving the changes.	
Save Options Save Changes Discard Changes					
Restore Defaults Save as User Defaults Restore User Defaults					
Boot Override SATA: FUJITSU MHZ2080BH G2 Built-in EFI Shell ▶ Reset System with ME Disable Mode				← →: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit	
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.					

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.

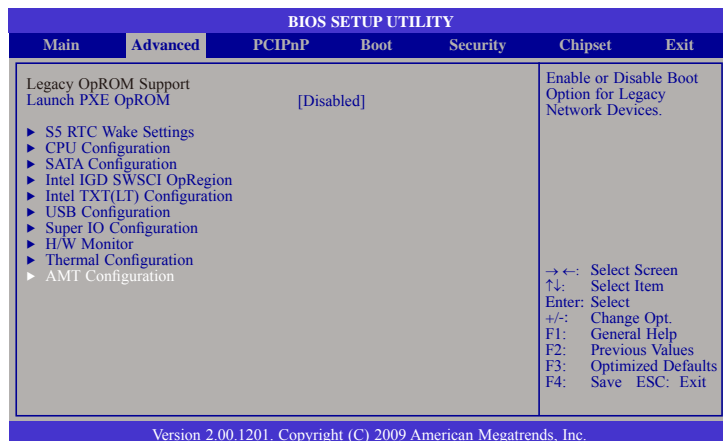
Discard Changes

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.

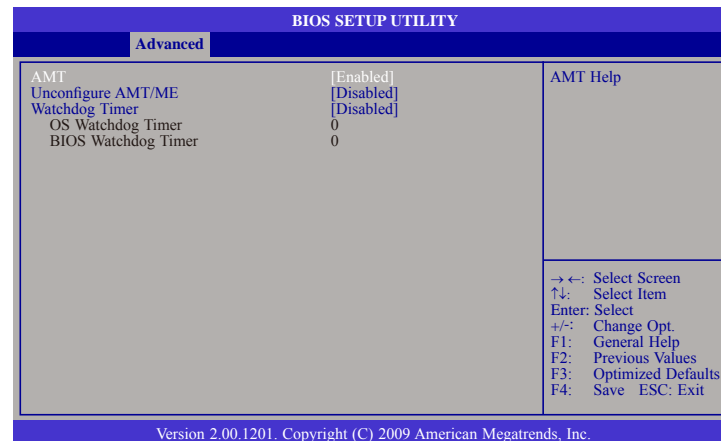
APPENDIX B: AMT SETTINGS

Enable Intel® AMT in the AMI BIOS

1. In the Advanced menu, select **AMT Configuration**.

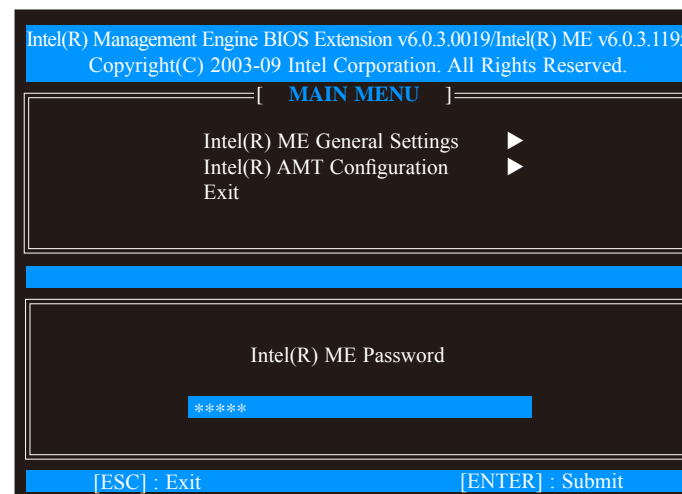
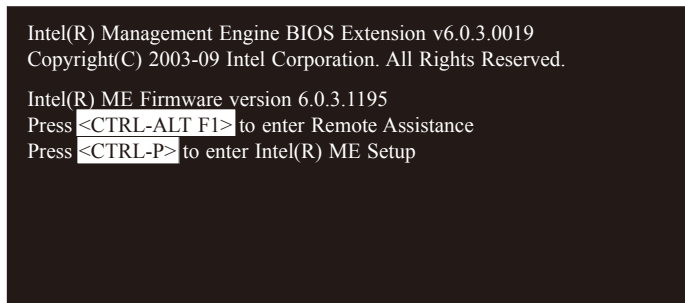


2. In the **AMT** field, select Enabled.



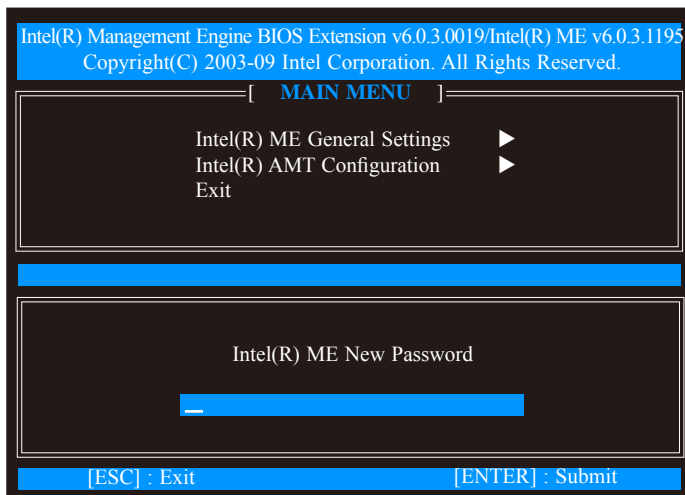
Configure the Intel® ME Setup

1. When the system reboots, the following message will be displayed. Press **<Ctrl-P>** as soon as the message is displayed; as this message will be displayed for only a few seconds.
2. You will be prompted for a password. The default password is "admin". Enter the default password in the space provided under Intel(R) ME Password and then press Enter.

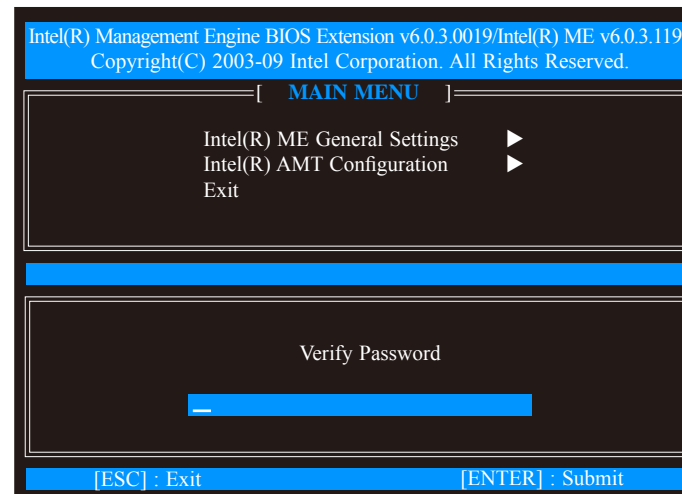


3. Enter a new password in the space provided under Intel(R) ME New Password and then press Enter. The new password must be based on the following rules to create a strong password security.

- Password length - at least 8 characters and not longer than 32.
- Password complexity - the password must include the following.
 - At least one digit character (0, 1, ...9)
 - At least one 7-bit ASCII non alpha-numeric character (e.g. !, \$, ;) but excluding : , and " characters
 - At least one lowercase letter ('a', 'b'...'z') and at least one uppercase letter ('A', 'B'...'Z')



4. You will be asked to verify the password. Enter the same new password in the space provided under Verify Password and then press Enter.

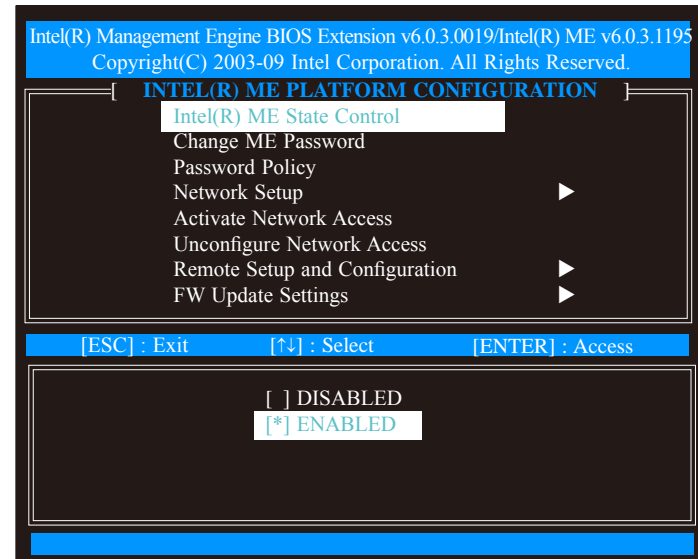


5. Select **Intel(R) ME General Settings** and then press Enter.

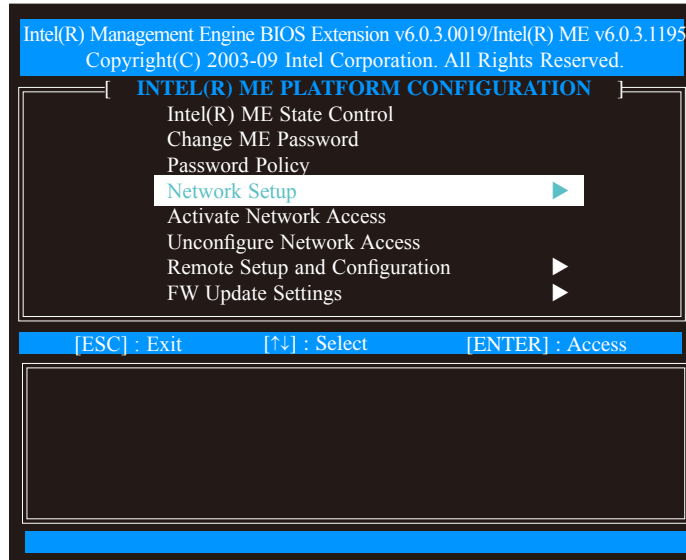


6. Select **Intel(R) ME State Control** and then press Enter.

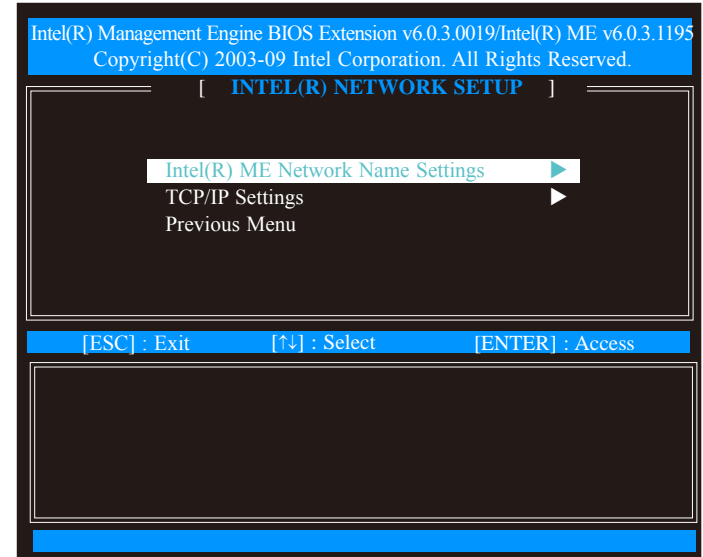
Select **Enabled** and then press Enter.



7. Select **Network Setup** and then press Enter.



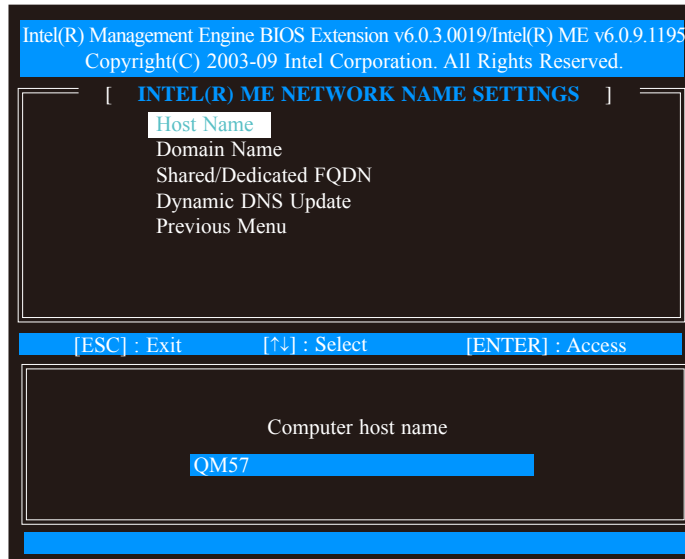
8. In the Intel(R) Network Setup menu, select **Intel(R) ME Network Name Settings** then press Enter.



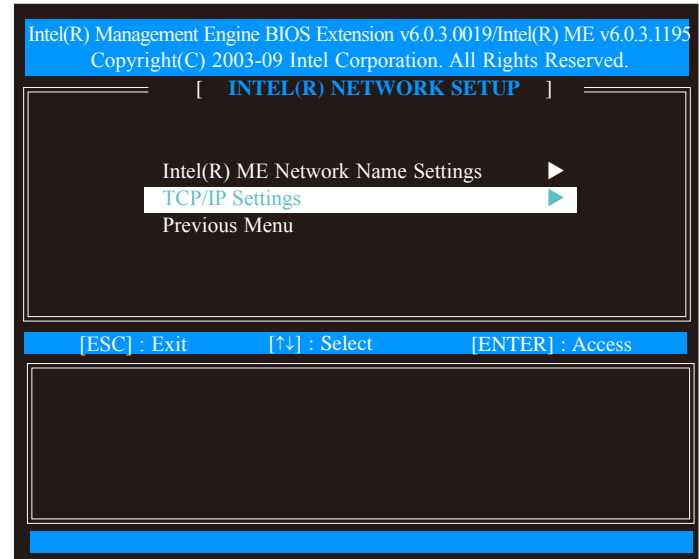
9. In the Intel(R) ME Network Name Settings menu, select **Host Name** and then press Enter.

Enter the computer's host name (for example: QM57) and then press Enter.

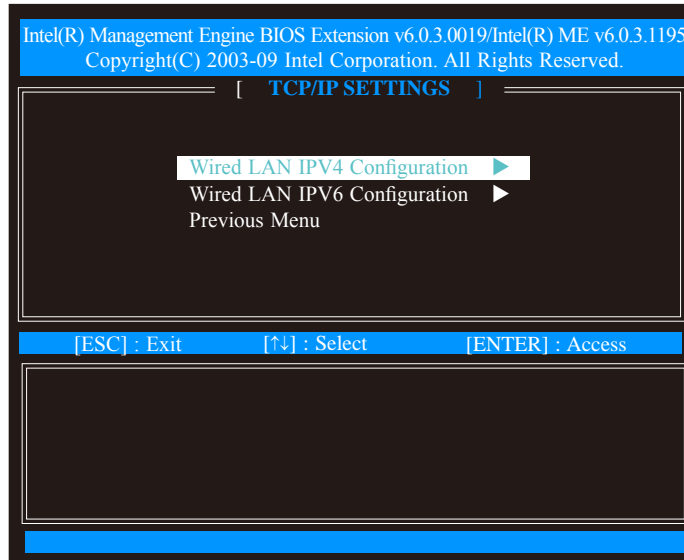
Select **Previous Menu** and then press Enter.



10. In the Network Setup menu, select **TCP/IP Settings** and then press Enter.

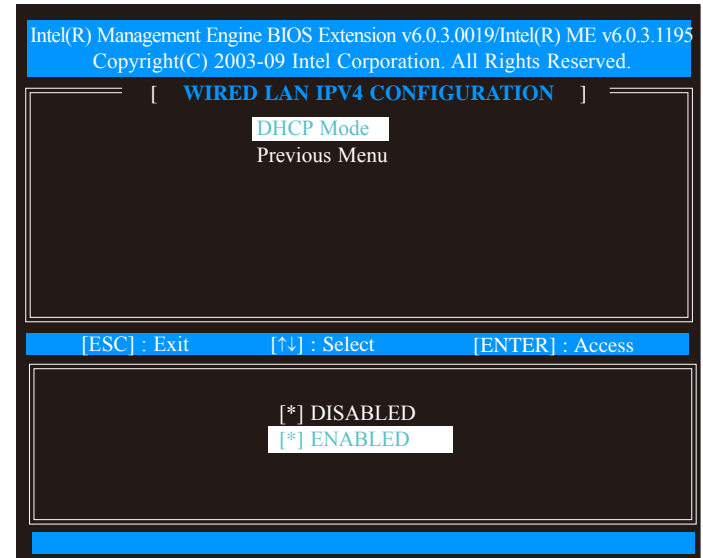


11. In the TCP/IP Settings menu, select **Wired LAN IPv4 Configuration** and then press Enter.



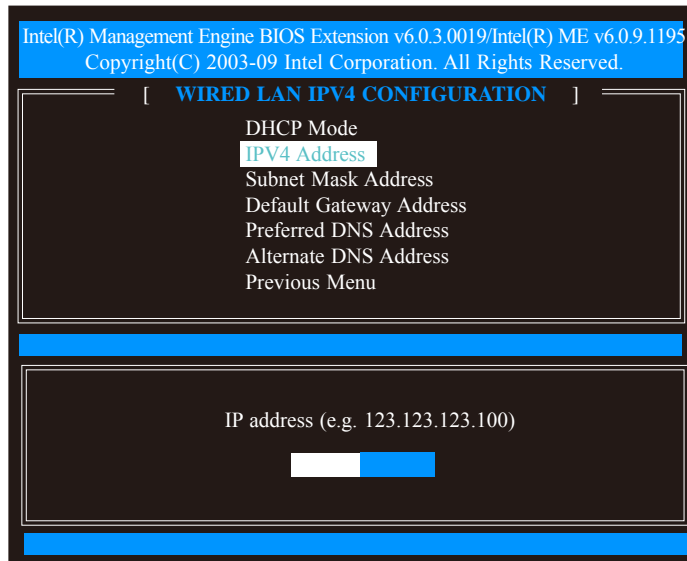
12. Select **DHCP Mode** and then press Enter.

Select **Enabled** or **Disabled** and then press Enter.



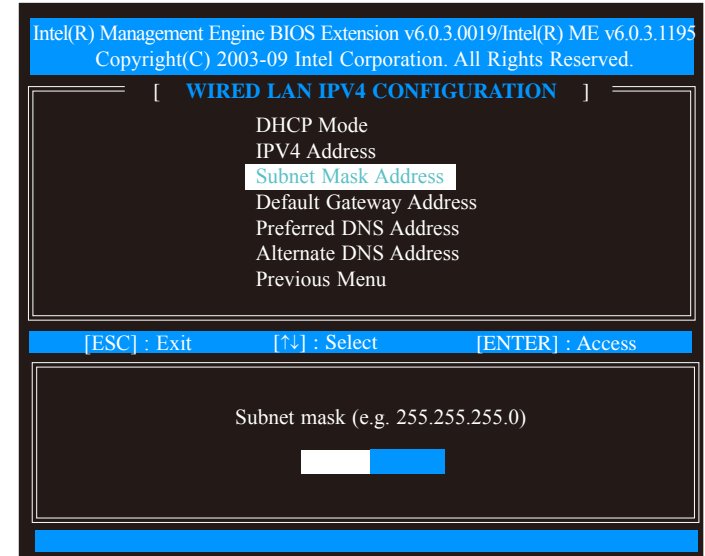
13. A list of options in the Wired LAN IPv4 Configuration menu will appear.

Select **IPv4 Address** and then press Enter. Enter an **IP Address** then press Enter.



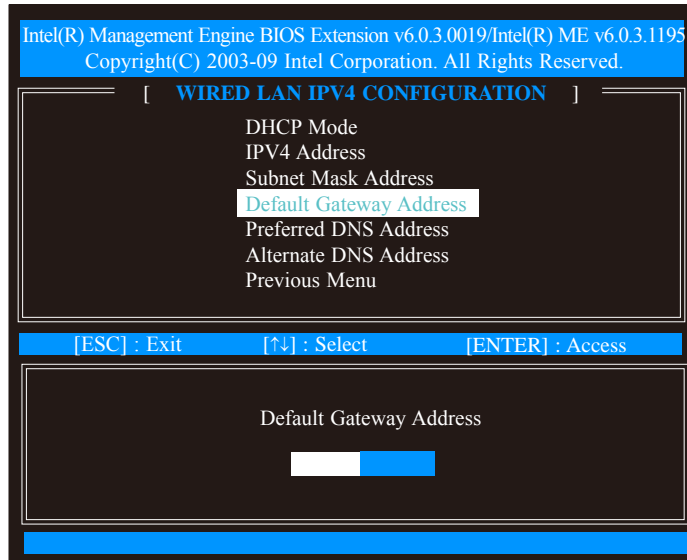
14. Select **Subnet Mask Address** and then press Enter.

Enter the **subnet mask address** and then press Enter.

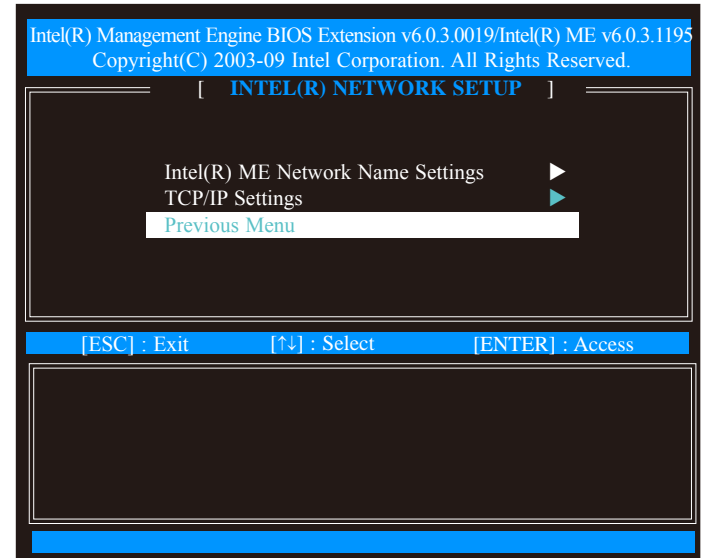


15. Select **Default Gateway Address** and then press Enter.

Enter the **default gateway address** and then press Enter.



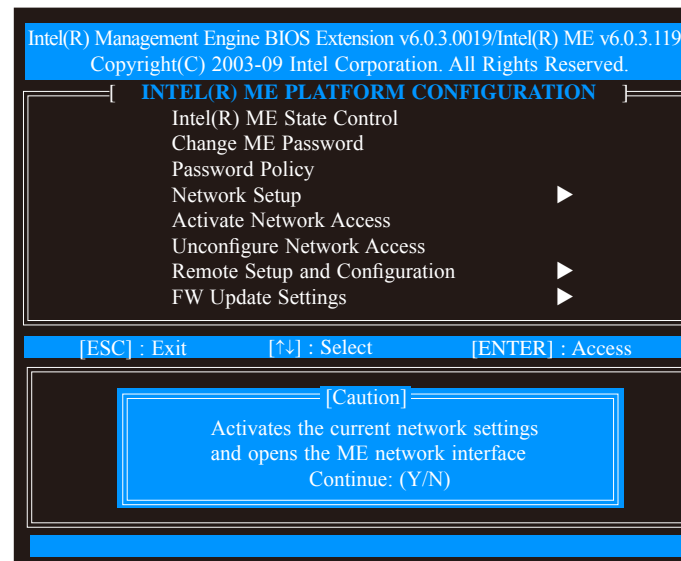
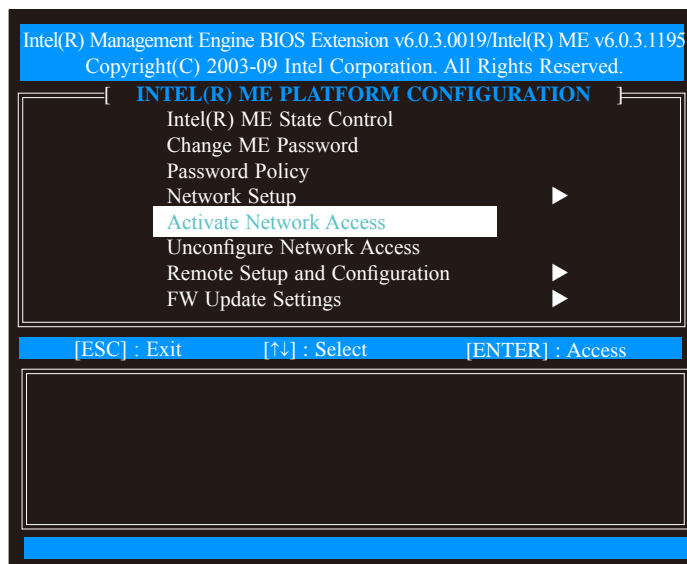
16. Select **Previous Menu** and then press Enter.



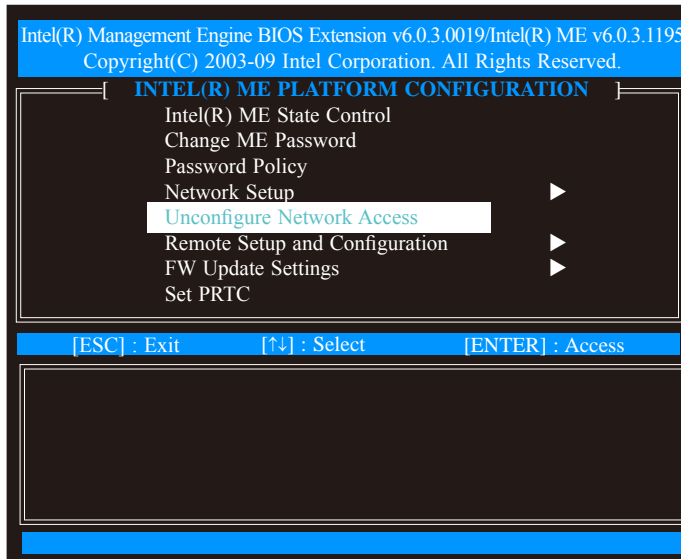
17. Select Previous Menu until you return to the **Intel(R) ME Platform Configuration** menu.

Select **Activate Network Access** and then press Enter.

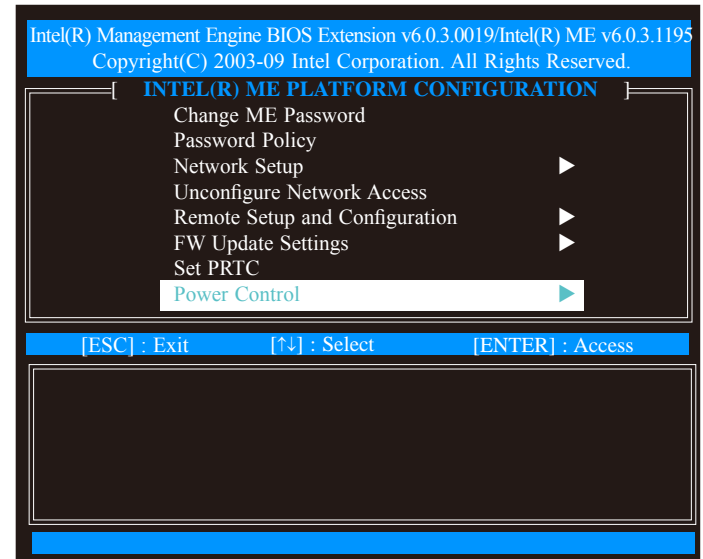
18. Type **Y** and then press Enter.



19. In the Intel(R) ME Platform Configuration menu, select **Unconfigure Network Access** and then press Enter. Clear all network settings.

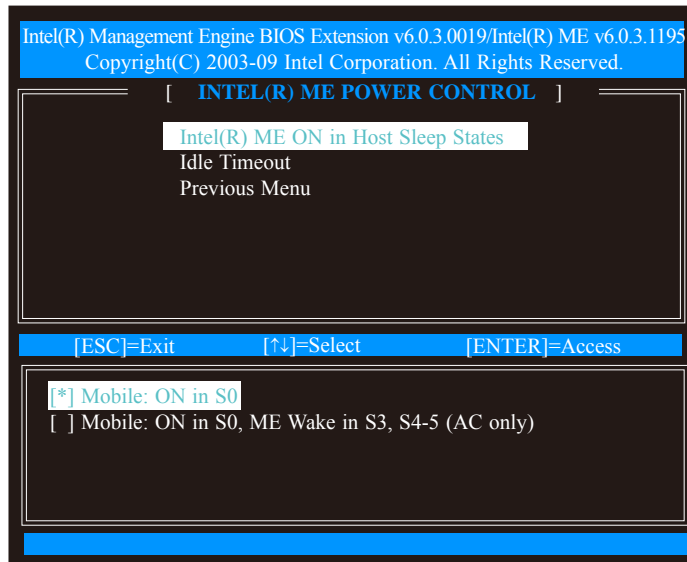


20. In the Intel(R) ME Platform Configuration menu, select **Power Control** and then press Enter.

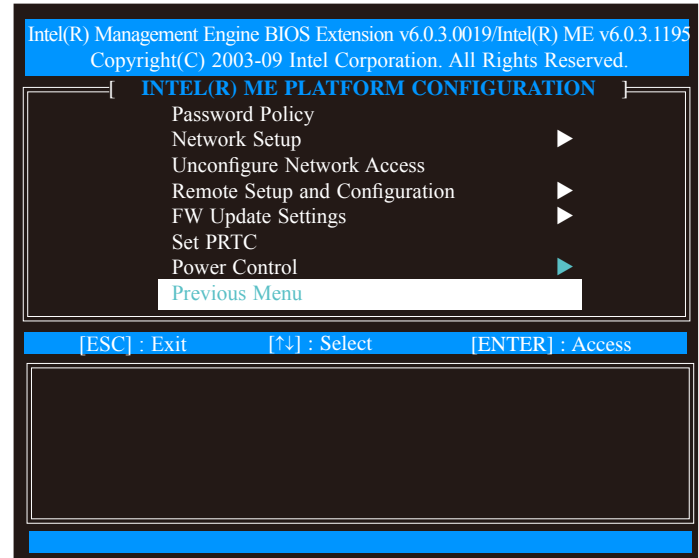


21. In the Intel(R) ME Power Control menu, select **Intel(R) ME ON in Host Sleep States** and then press Enter.

Select **Mobile: ON in S0** and then press Enter.



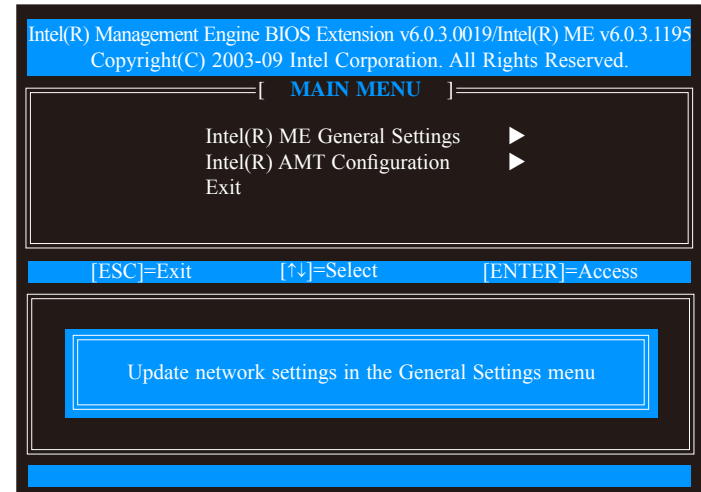
22. Select **Previous Menu** and then press Enter.



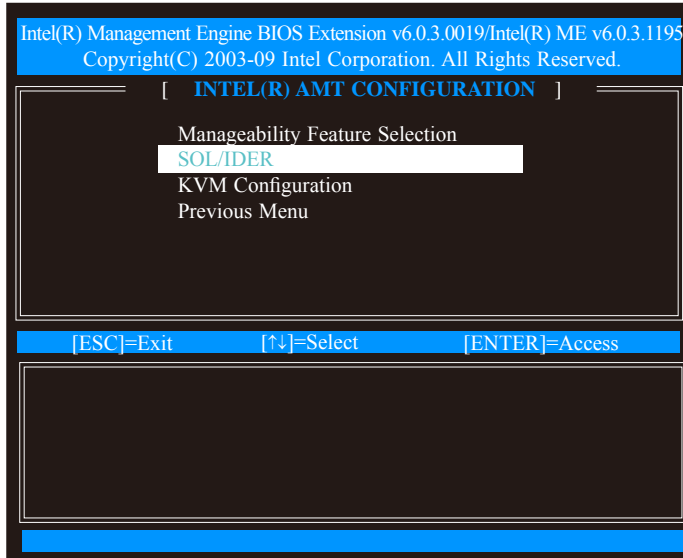
23. Select Previous Menu until you return to the Main Menu. Select **Intel(R) AMT Configuration**.



24. The message below will appear.

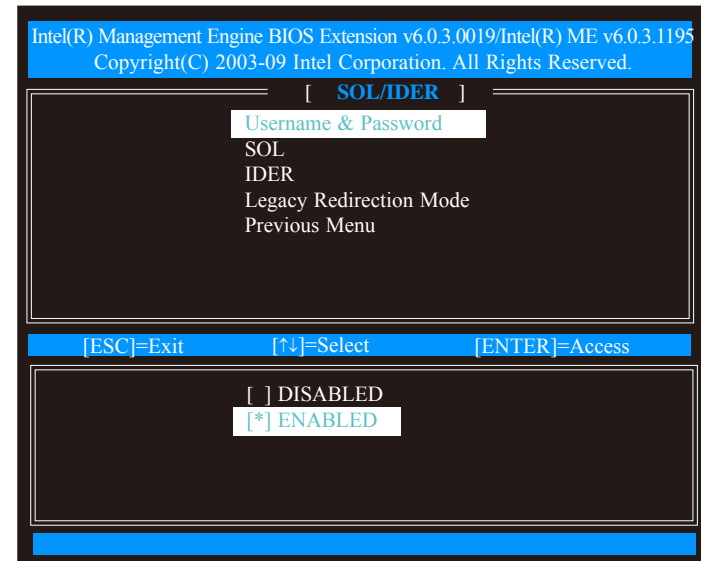


25. In the Intel(R) AMT Configuration menu, select **SOL/IDER** and then press Enter.



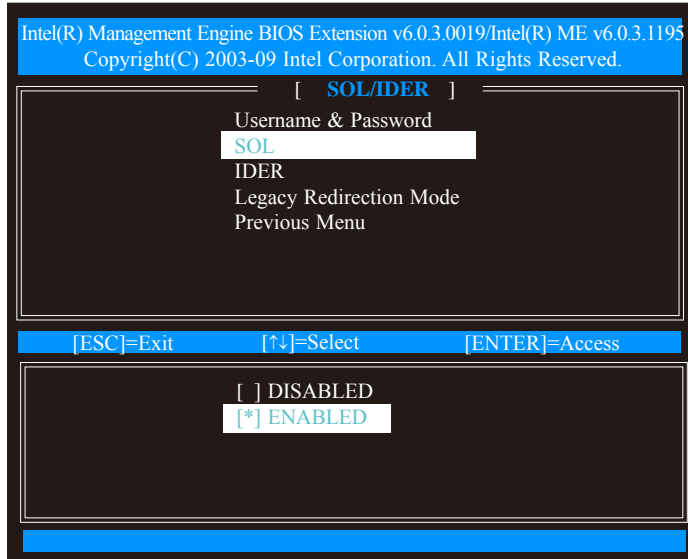
26. In the SOL/IDER menu, select **Username & Password** and then press Enter.

Select **Enabled** and then press Enter.



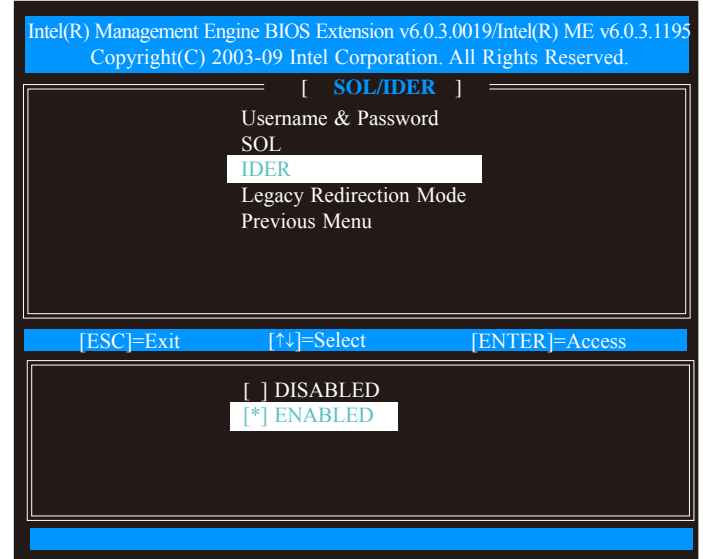
27. In the SOL/IDER menu, select **SOL** and then press Enter.

Select **Enabled** and then press Enter.

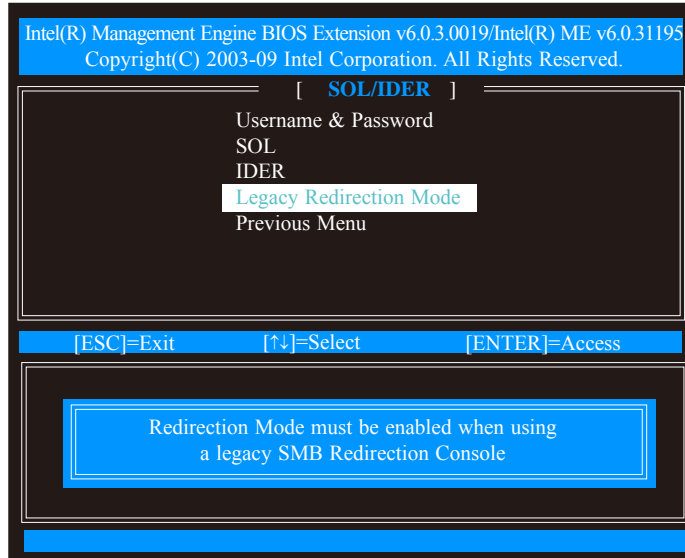


28. In the SOL/IDER menu, select **IDER** and then press Enter.

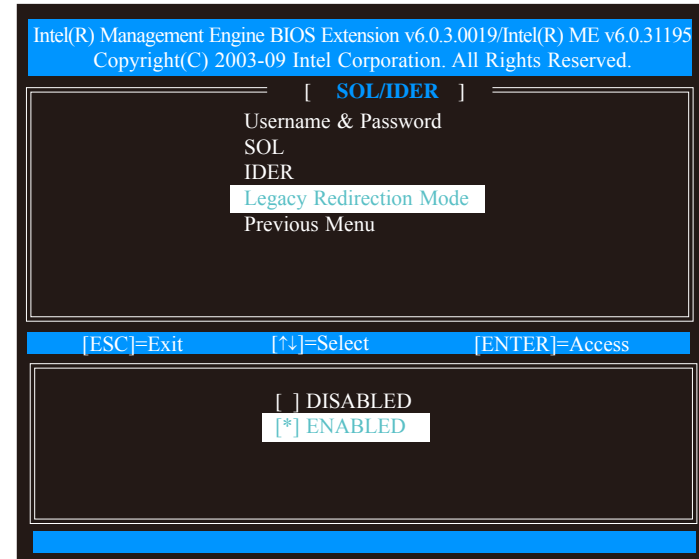
Select **Enabled** and then press Enter.



29. In the SOL/IDER menu, select **Legacy Redirection Mode** and then press Enter.

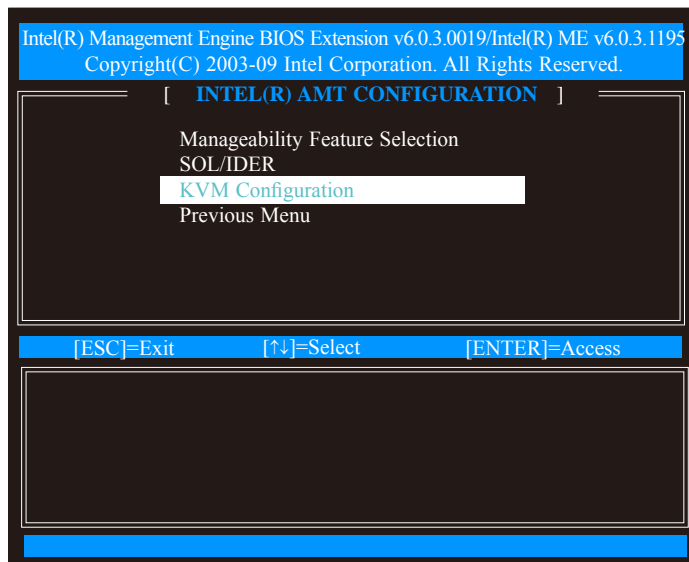


30. Select **Enabled** and then press Enter.



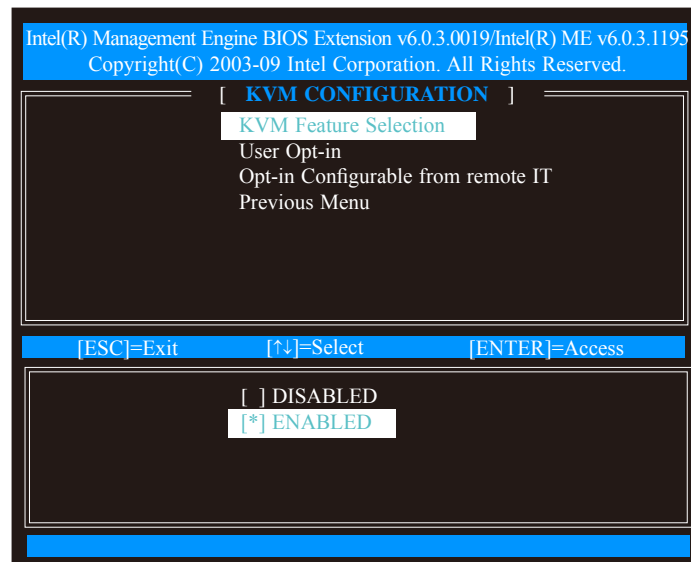
31. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu.

Select **KVM Configuration** and then press Enter.



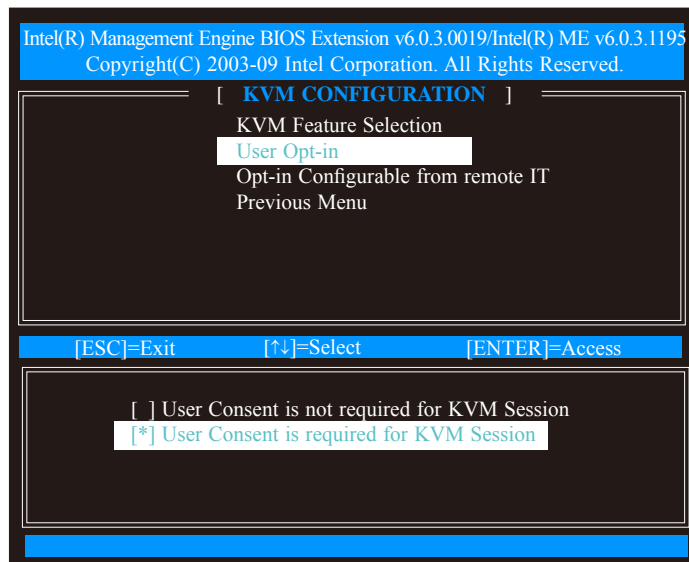
32. In the KVM Configuration menu, select **KVM Feature Selection** and then press Enter.

Select **Enabled** and then press Enter.



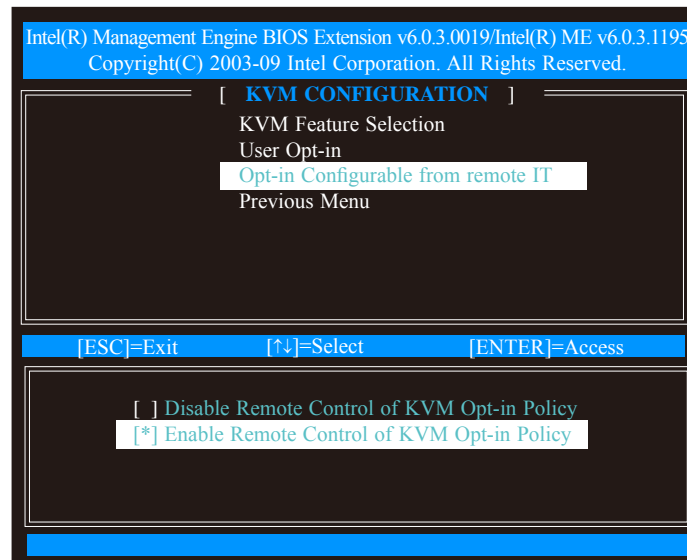
33. In the KVM Configuration menu, select **User Opt-in** and then press Enter.

Select **User Consent is required for KVM Session** and then press Enter.

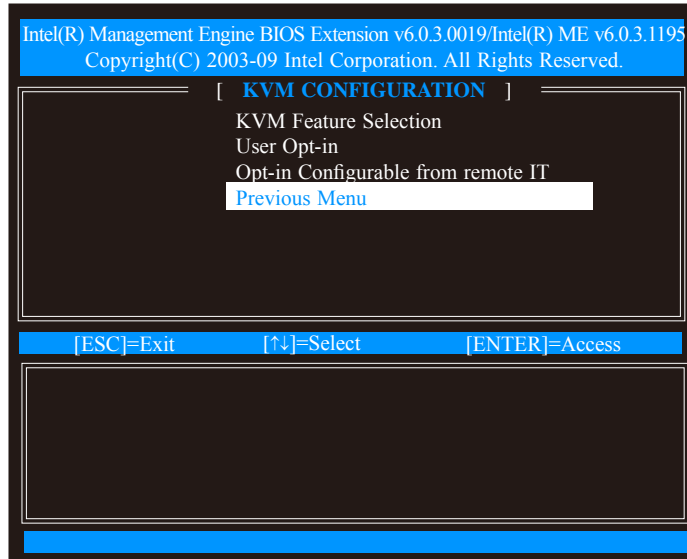


34. In the KVM Configuration menu, select **Opt-in Configurable from Remote IT** and then press Enter.

Select **Enable Remote Control of KVM Opt-in Policy** and then press Enter.



35. Select **Previous Menu**.

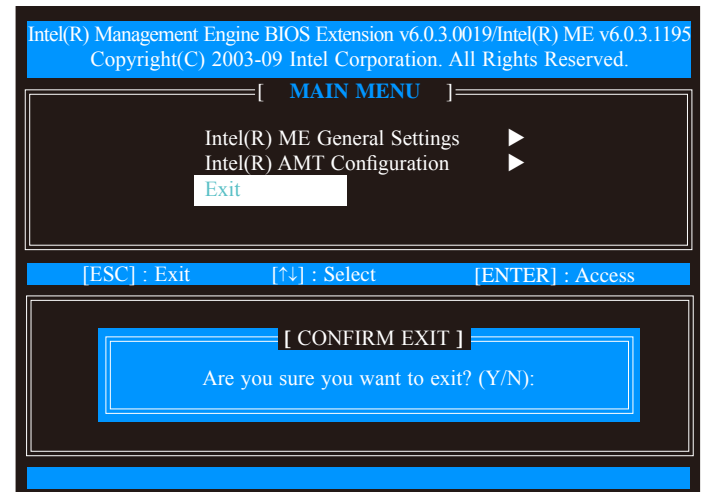


36. Select Previous Menu until you return to the Main Menu. Select **Exit** and then press Enter.

The following message will be displayed on the screen.

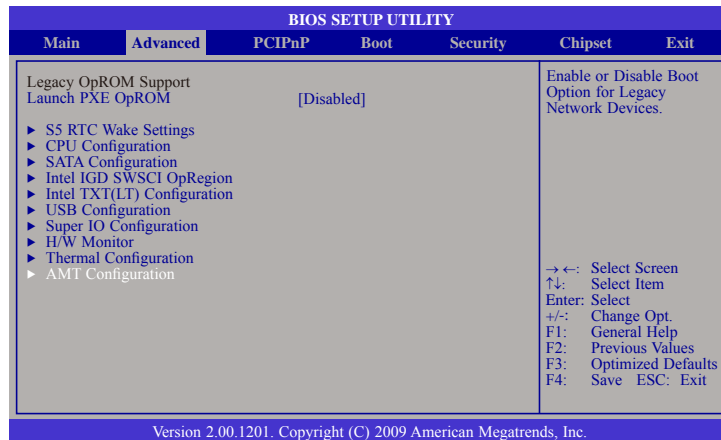
[CONFIRM EXIT]
Are you sure you want to exit? (Y/N):

Press Y.

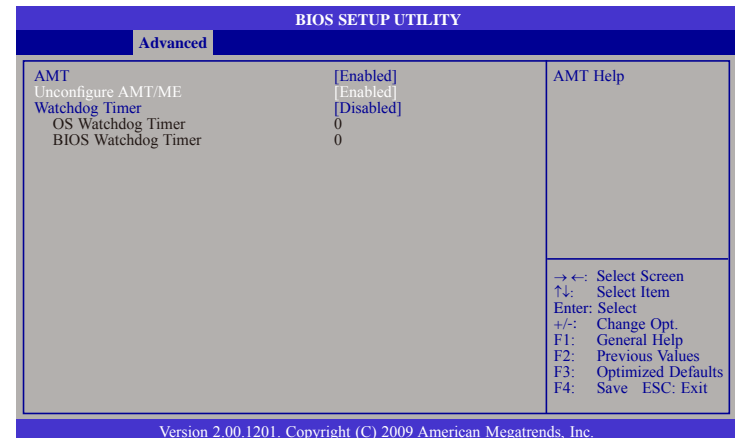


Unconfigure AMT/ME

1. In the Advanced menu, select **AMT Configuration**.



2. In the **Unconfigure AMT/ME** field, select Enabled. Clear all ME settings.



3. The message below will appear. Type **Y**.

```
Intel(R) Management Engine BIOS Extension v6.0.3.0019  
Copyright(C) 2003-09 Intel Corporation. All Rights Reserved.  
  
Found unconfigure of Intel(R) ME  
Continue with unconfiguration (Y/N)
```


APPENDIX C: GPIO PROGRAMMING GUIDE

GPIO (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and its default setting for the ten GPIO pins in NET 3500-ECM. The pin definition is shown in the following table:

Pin No.	GPIO mode	PowerOn Default	Address	Pin No.	GPIO mode	PowerOn Default	Address
1	VCC	-	-	2	GND	-	-
3	GPO	Low	3E4h (Bit4)	4	GPI	High	3E4h (Bit0)
5	GPO	Low	3E4h (Bit5)	6	GPI	High	3E4h (Bit1)
7	GPO	Low	3E4h (Bit6)	8	GPI	High	3E4h (Bit2)
9	GPO	Low	3E4h (Bit7)	10	GPI	High	3E4h (Bit3)

JP2 – GPIO Connector

Control the GPO pin (3/5/7/9) level from I/O port 3E4h bit (4/5/6/7). The bit is Set/Clear indicated output High/Low

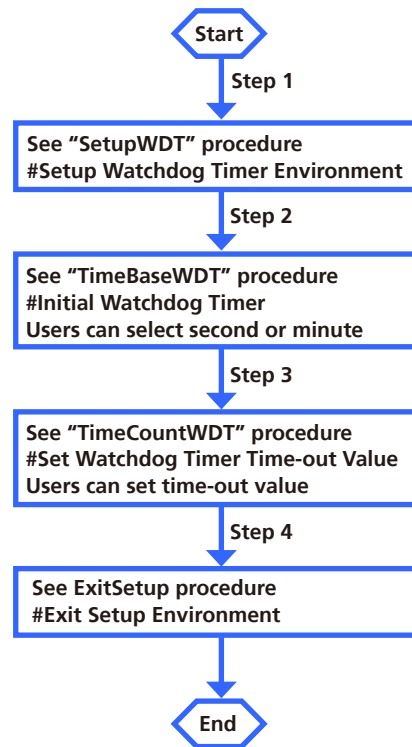
GPIO programming sample code

```
#define GPIO_PORT      0x3E4
#define GPO3           (0x01 << 4)
#define GPO5           (0x01 << 5)
#define GPO7           (0x01 << 6)
#define GPO9           (0x01 << 7)

#define GPO3_HI        outputb(GPIO_PORT, 0x10)
#define GPO3_LO        outputb(GPIO_PORT, 0x00)
#define GPO5_HI        outputb(GPIO_PORT, 0x20)
#define GPO5_LO        outputb(GPIO_PORT, 0x00)
#define GPO7_HI        outputb(GPIO_PORT, 0x40)
#define GPO7_LO        outputb(GPIO_PORT, 0x00)
#define GPO9_HI        outputb(GPIO_PORT, 0x80)
#define GPO9_LO        outputb(GPIO_PORT, 0x00)

void main(void)
{
    GPO3_HI;
    GPO5_LO;
    GPO7_HI;
    GPO9_LO;
}
```

APPENDIX D: WATCHDOG TIMER SETTING



```
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

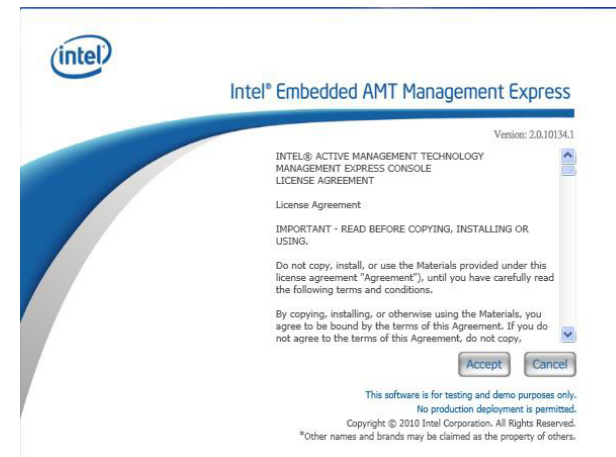
APPENDIX E: INTEL EMBEDDED AMT MANAGEMENT EXPRESS KVM

1. After installing the Intel Embedded AMT Management Express utility, the **Intel Embedded AMT Management Express** icon will appear on your desktop.

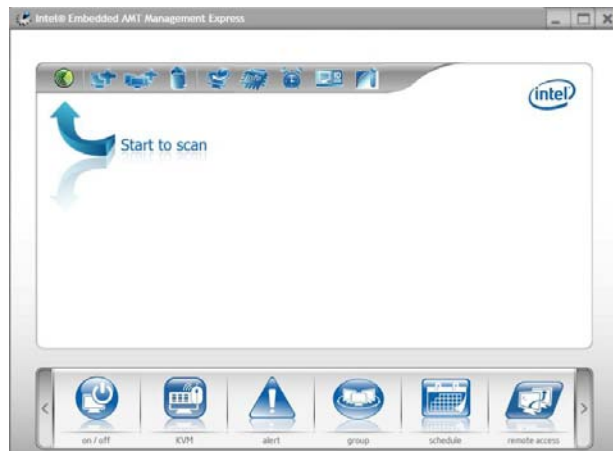


2. Double-click the icon to run Intel Embedded AMT Management Express.

3. When the Intel Embedded AMT Management Express dialog box appears, click **Accept**.



- Click the first icon in the toolbar (top row).



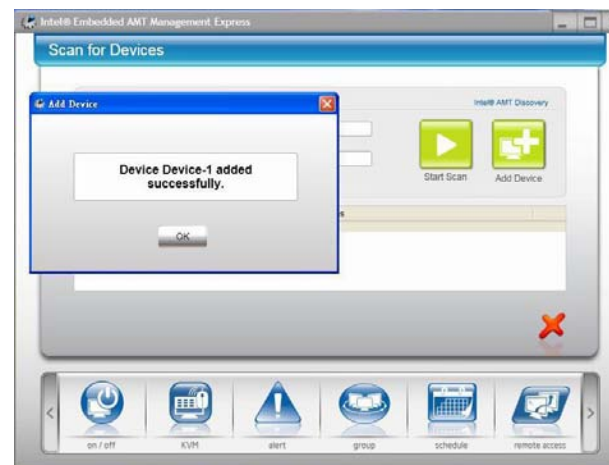
- Enter a range of IP addresses that is within the network to find iAMT computers.
- Click the **Start Scan** icon.



- The iAMT computers that were detected within the network will appear under the Discovered Devices list.

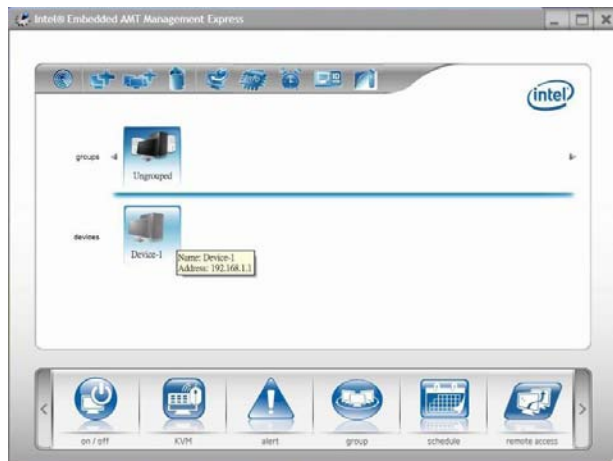


- Click **Add Device**. A dialog box will appear.
Enter the ME BIOS' username "admin" and password. Click **OK**.
- After you have added the iAMT computer, a dialog box will appear informing you that the device was added successfully. Click **OK**.

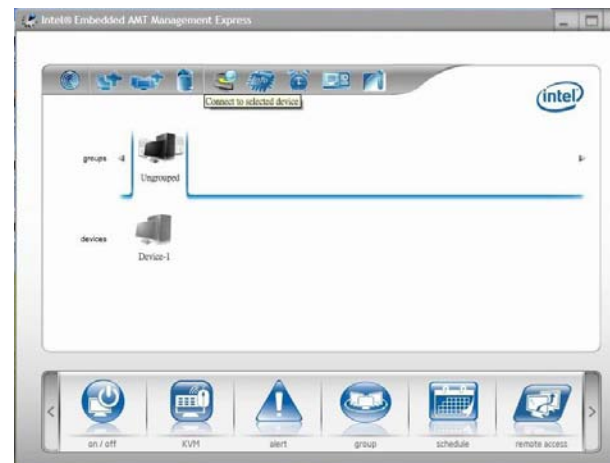


10. In the Intel Embedded AMT Management Express main menu, you will notice the **Device-1** icon in the Device section.

Move the cursor to **Device-1** and you will see the remote iAMT computer's IP address.

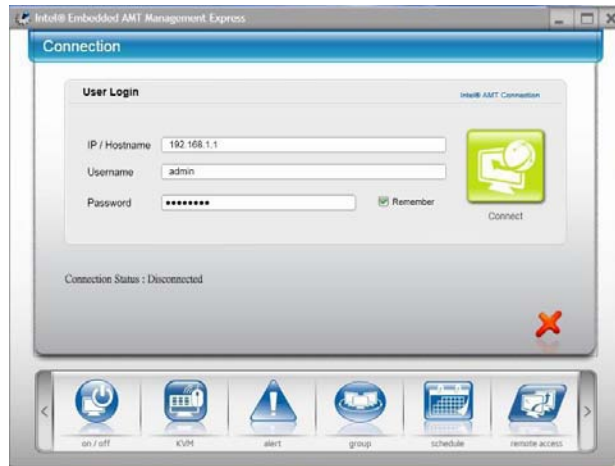


11. Click the 5th icon (Connect to Selected Device) in the toolbar to connect to the remote iAMT computer.



12. In the Connection dialog box, enter the remote computer's IP address, ME BIOS' username "admin" and password.

Click the **Connect** icon to connect to the remote computer.



13. Once the server is connected to the remote computer, the message **Connection Status: Connection Established** will appear at the bottom of the screen.



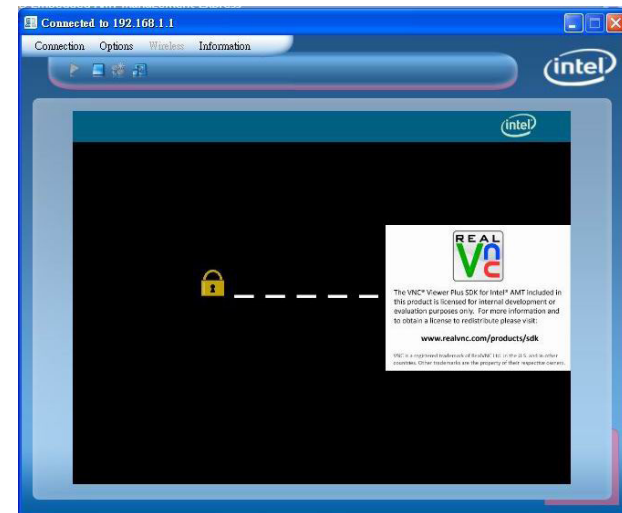
14. In the Intel Embedded AMT Management Express main menu, click the **KVM** icon.



15. The Remote KVM screen will appear. In the KVM Password field, enter the ME BIOS admin's password and then click the **Start Session** icon.

You will be prompted to enter the **VNC's password**.

Enter the 6-character password that appeared on the remote computer.



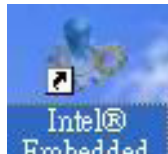
16. When the server is connected to the remote iAMT computer, the server will be able to see the remote computer's current image.



If you entered the wrong password thrice, a message will appear notifying you that the server and remote computer's VNC connection failed. You must click the **KVM** icon again and then select **KVM Viewer Redirect Port** to reconnect.

APPENDIX F: INTEL MANAGEABILITY COMMAND TOOL - KVM

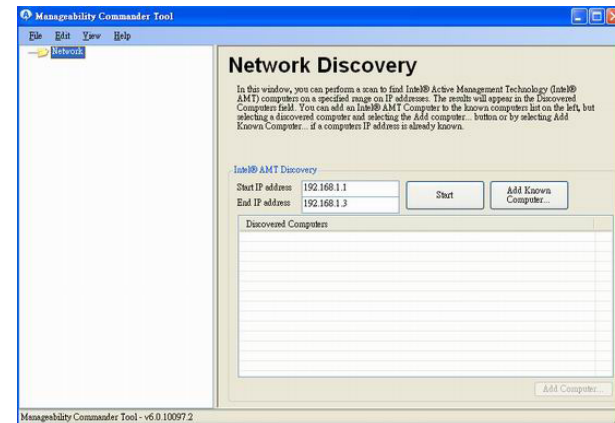
1. After installing the Intel Manageability Commander Tool, the **Manageability Commander Tool** icon will appear on your desktop.



2. Double-click the icon to run Manageability Commander Tool.

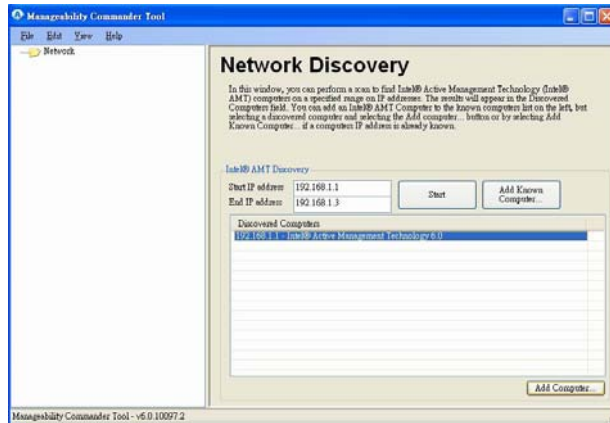
The Network Discovery screen allows you to scan to find iAMT computers (with the ME BIOS configured) on the specified range of IP addresses.

3. Enter a range of IP addresses that is within the network. Enter the **Start IP address** and **End IP address**.
4. Click **Start** to search for iAMT computers that are in the designated range.



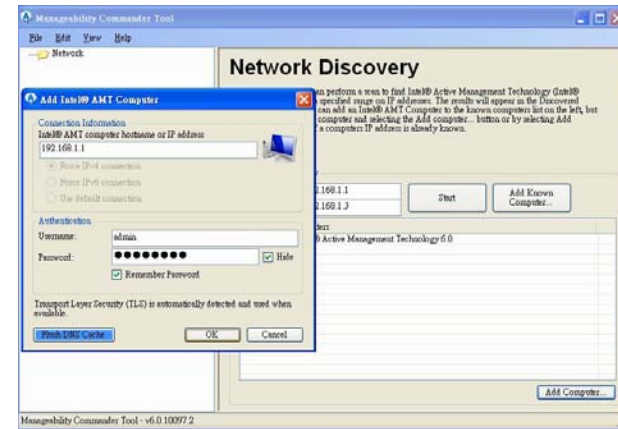
- The detected iAMT computer will appear in the Discovered Computers field.

You can either click **Add Known Computer** to add the iAMT computer to the Network list on the left column or double-click the computer name under the Discovered Computers list.

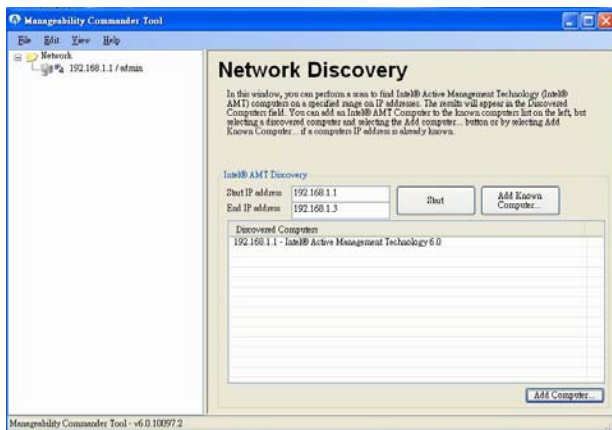


- After adding the iAMT computer, a dialog box will appear. Enter the username "admin" and password used by the ME BIOS of the iAMT computer.

Click **OK**.



- The newly added iAMT computer with its IP address will appear under the Network list located at the left column of the screen.



- On the left column, under Network, select the iAMT computer. The Connect & Control screen will appear on the right side.

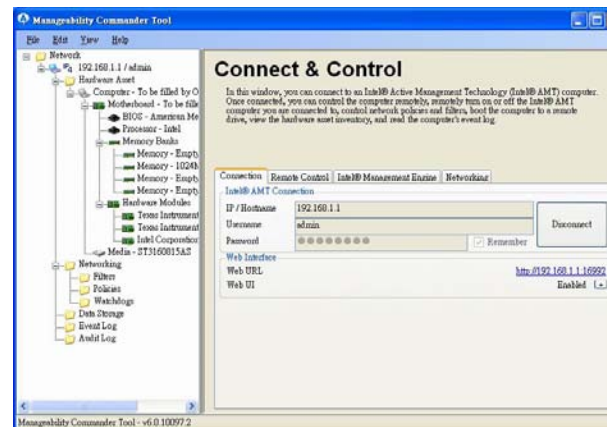
Select the **Connection** tab and then click **Connect**. The Manageability Commander Tool will connect the iAMT computer with the server.



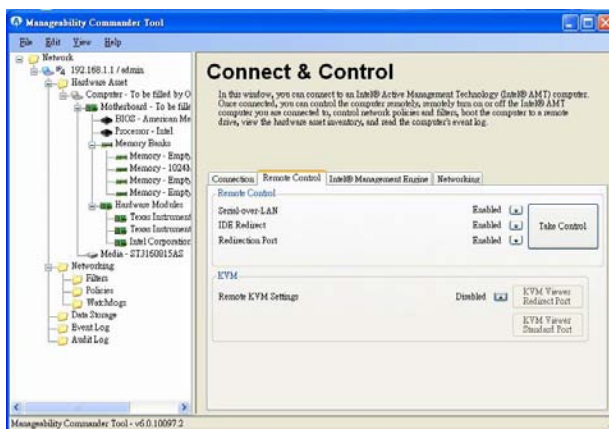
9. The iAMT computer's icon under the Network list will turn from gray to blue. The server and iAMT computer are now connected.



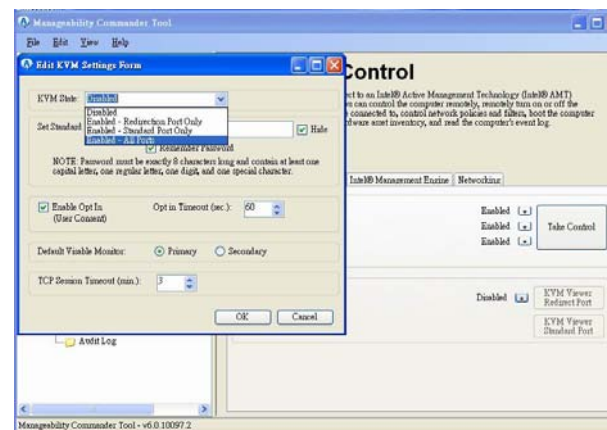
10. Display the hierarchical structure of the iAMT computer's files and folders. This will allow you to view the remote computer's hardware status and configuration.



11. On the right side of the screen, select the **Remote Control** tab.
12. Under the KVM section, check whether the Remote KVM Setting's status is All Parts Enabled. If not, click the ↓ arrow beside it.



13. The Edit KVM Settings Form dialog box will appear. In the KVM State field, click the scroll down arrow and then select **Enabled - All Ports**. Click **OK**.



14. The Remote KVM screen will appear. Select **KVM Viewer Redirect Port**. The server will prompt you to enter the VNC's password.

The remote iAMT's computer will at the same time display the Intel KVM Remote Assistance Application program's 6-character password.



15. After the server entered the 6-character password provided by the remote computer's screen, the server will be able to see the remote computer's current image.

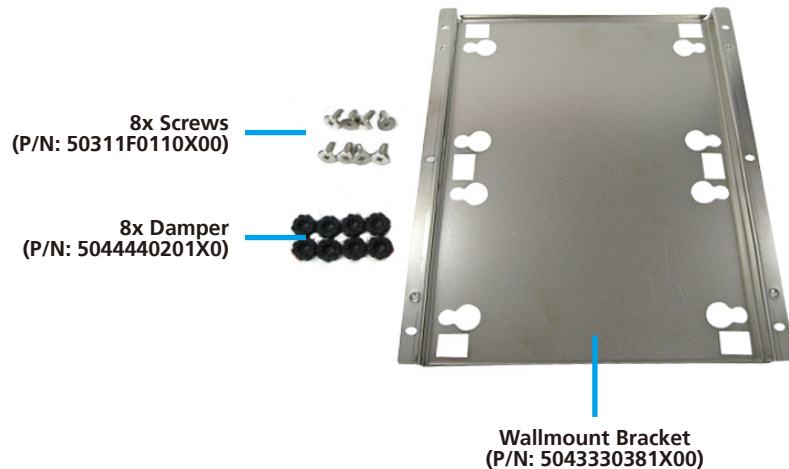


If you entered the wrong password thrice, a message will appear notifying you that the server and remote computer's VNC connection failed. You must click the **KVM** icon again and then select **KVM Viewer Redirect Port** to reconnect.

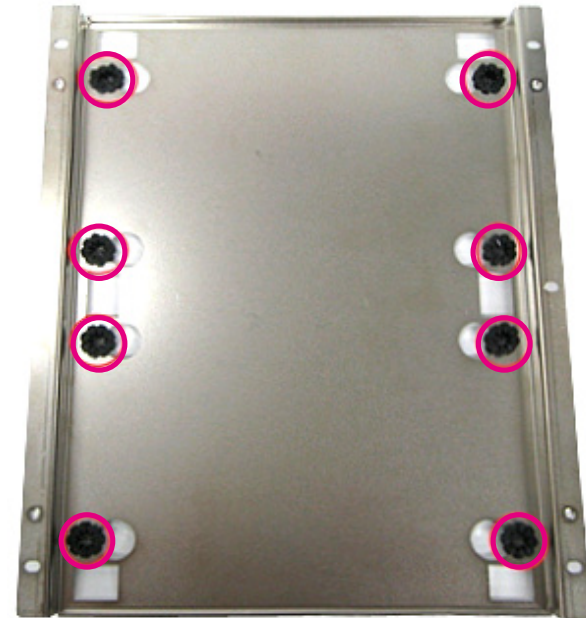
APPENDIX G: EXTERNAL ANTI-VIBRATION KIT

1. Parts:

- a. 1x Wallmount Bracket (P/N: 5043330381X00)
- b. 8x Screws (P/N: 50311F0110X00)
- c. 8x Damper (P/N: 5044440201X0)

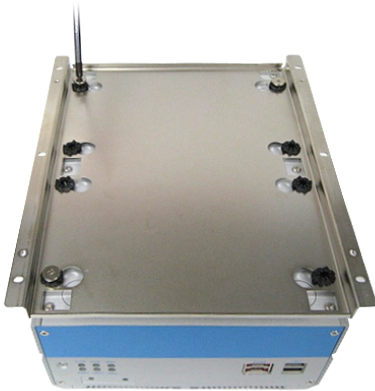


2. Insert 8x dampers (P/N: 5044440201X0) into following 8x locations



3. Secure the bracket to the system with 8x screws (P/N: 50311F0110X00)

4. Mounting style



Secure the bracket to the system with 8x screws



Finish



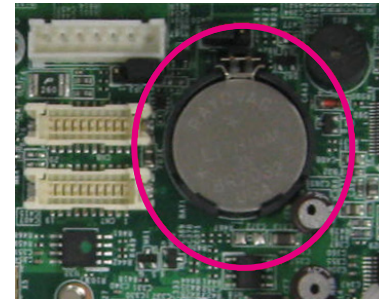
Four 6-32 Screws for mounting
Caution: Ceiling mount is not suggested

5. Vibration Protection with External Anti-Vibration kit

- a. Random: 1G @ 5-500Hz according to IEC68-2-64
- b. Sinusoidal: 1G @ 5-500Hz according to IEC68-2-6

6. Battery replacement:

- a. Battery type: BR2032
- b. Please download the BIOS default after battery replacement

**Caution:**

- a. Risk of Explosion if battery is replaced by an incorrect type
- b. Dispose of used batteries according to the instruction

7. AC/DC Power Adapter:

- a. Use only with UL listed / IEC60950-1 approved power supply, rated O/P: 24Vdc, Minimum 5A, minimum operating temperature 55°C
- b. Use only the power adapter which specified 55°C minimum in operating temperature condition

8. Dimension of the anti-vibration kit

