

# MC-7130-MP Hardware Manual

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# MC-7130-MP Hardware Manual

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# Introduction

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The MOXA MC-7130-MP marine computer is powered by the third generation Intel® Core™ i3 3120ME processor and offers a wide range of I/O connectivity that includes eight NMEA 0183 ports, four serial ports, four Gigabit Ethernet ports, six USB 2.0 and two SuperSpeed USB 3.0 ports. In addition, it also provides a third generation PCIe x16 slot alongside two standard PCI slots, allowing versatile peripheral expansion for industrial applications.

The MC-7130-MP's rugged and fanless design and 1G anti-vibration make it particularly well-suited for bridge systems in marine applications. In addition, the compact size and low power consumption ensure an easy installation and dependable service, while its modular design allows easy integration with existing displays.

Users can easily install Windows 7, Windows XP SP3, or Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

The following topics are covered in this chapter:

- ❑ **Overview**
- ❑ **Package Checklist**
- ❑ **Product Features**
- ❑ **Hardware Specifications**
  - Hardware Block Diagram

## Overview

The MOXA MC-7130-MP marine computer is powered by the third generation Intel® Core™ i3 3120ME processor and offers a wide range of I/O connectivity including eight NMEA 0183 ports, four serial ports, four Gigabit Ethernet ports, six USB 2.0 and two SuperSpeed USB 3.0 ports. In addition, it also provides a third generation PCIe x16 slot alongside two standard PCI slots, allowing versatile peripheral expansion for industrial applications.

Users can also choose to install Windows 7, Windows XP SP3, or Windows XP Embedded operating systems to provide a flexible and friendly environment for system development and application implementation.

## Package Checklist

### One MC-7130-MP:

A ready-to-run x86 computing platform with Intel Core™ i3 3120E, 4 serial ports, 4 Gigabit Ethernet ports, 6 USB hosts, 8 NMEA ports, storage drives, and VGA/DVI-D video outputs.

Each model ships with the following items:

- 1 MC-7130-MP marine computer
- 2 storage protection locks (with keys)
- 8 screws for drive mounts
- Wall mounting kit, with 6 screws
- 1 terminal block for DC power input
- 2 6-pin digital input terminal blocks
- 2 8-pin digital output terminal blocks
- 8 NMEA 0183 ports
- Documentation and driver CD
- Quick Installation Guide (printed)
- Warranty card

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

## Product Features

The MC-7130-MP embedded computer has the following features:

- High-performance 3rd generation Intel Core i3 3120ME processor
- Built-in 4 GB DDR3 memory, with additional capacity up to 16 GB
- Supports three independent displays (2 DVI-D + 1 VGA)
- 4 Gigabit Ethernet ports for network redundancy
- 1 PCIe (x16) slot, 2 universal PCI slots
- 2 software-selectable RS-232/422/485 serial ports
- 2 RS-232 ports
- 8 NMEA 0183 ports
- 6 USB 2.0 hosts, 2 USB 3.0 ports
- 2 integrated SATA 6 Gbps and 2 SATA 3 Gbps interfaces for high speed storage expansion
- Trusted Platform Module: integrated hardware-level security for maximum data protection
- 1G anti-vibration design for system reliability
- 24 VDC and 100 to 240 VAC power input
- Supports Windows XP Embedded, Windows XP SP3, or Windows 7

# Hardware Specifications

## Computer

**CPU:** Intel® Core™ i3-3120ME (BGA CPU package), dual core threaded 64 bit 2.4 GHz processor

**OS:** Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)

**System Chipset:** Intel® QM77 Express Chipset

**System Memory:** 16 GB capacity, 4 GB pre-installed: 2 slots of 8 GB DDR3-1066 204 pin SO-DIMM SDRAM

**USB:** USB 2.0 host x 6, USB 3.0 host x 2, Type A connectors

## Storage

### Storage Support:

- 2 SATA 6 Gb/s ports for SSD/HDD
- 2 SATA 3 Gb/s ports for SSD/HDD

## Other Peripherals

**KB/MS:** 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

**Audio:** Line in x 1, Line out x 1, Mic in x 1

**LPT Port:** 1

**PCIe x16 Slots:** 1

**PCI Slots:** 2

## Display

**Graphics Controller:** Onboard Intel® HD 4000 graphics

### Display Interface:

- VGA Interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
- DVI-D Interface x 2: 29-pin DVI-D connectors (female), with resolution up to 1920 x 1080, 60Hz (with reduced blanking)

## Ethernet Interface

**LAN:** 4 auto-sensing 10/100/1000 Mbps ports (RJ45)

**Magnetic Isolation Protection:** 1.5 KV built in

## Serial Interface

### Serial Standards:

- 2 RS-232/422/485 ports, software-selectable (DB9 male)
- 2 RS-232 ports (DB9)
- 8 NMEA 0183 terminals (NMEA 2000 available on request)

## Serial Communication Parameters

**Data Bits:** 5, 6, 7, 8

**Stop Bits:** 1, 1.5, 2

**Parity:** None, Even, Odd, Space, Mark

**Flow Control:** RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

**Baudrate:** 50 bps to 230.4 Kbps

## Serial Signals

**RS-232:** TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

**RS-422:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-4w:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-2w:** Data+, Data-, GND

## NMEA Interface

### Serial Standards:

NMEA 0183v2 (NMEA 2000 available on request)

### Base Serial Standard:

- NMEA 0183: RS-422
- NMEA 2000: CAN bus (Available on request)

**Optical Isolation Protection:** 3 KV

**Voltage Differential:** -15 V to +15 V

**Baudrate:** 4800 bps

**Data Bits:** 8

**Stop Bits:** 1, 1.5, 2

**Parity:** None

**Handshake:** None

### Digital Input

**Input Channels:** 8 dry channels, with 4 grounds

#### Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

**Connector Type:** 6-pin Phoenix-compatible 3.81 mm screw terminal block, x 2

**Isolation:** ESD protection to DNV specifications

### Relay Output

**Type:** Form A (N.O.) power relay

**Output Channels:** 8 output channels

**Contact Rating:** 2A, 30Vdc /0.5A, 125Vac under resistor load

**Initial Insulation Resistance:** 1000M ohm (min.) @500VDC

**Mechanical Endurance:** 100,000 operations @2A, 30VDC resistive load

**Electrical Endurance:** 100,000,000 operations

**Contact Resistance:** Max. 50m ohm @6V, 0.1A

**Connector Type:** 8-pin Phoenix-compatible 3.81 mm screw terminal block, x 2

**Isolation:** Relay isolation; ESD protection to DNV specifications

### LEDs

**System:** Storage, Power

**LAN:** 100M/Link x 4, 1000M/Link x 4 (on connector)

### Physical Characteristics

**Housing:** Aluminum, sheet metal

**Weight:** 8 kg

**Dimensions:** 322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)

**System Cooling:** Moxa AI-Fan

**Mounting:** Wall

### Environmental Limits

**Operating Temperature:** -15 to 55°C (5 to 131°F)

**Storage Temperature:** -20 to 60°C (-4 to 131°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

#### Anti-Vibration:

- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

### Power Requirements

#### Input Voltage:

- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

**Power Consumption:** Less than 100 W, 2.5 A @ 24 VDC

### Standards and Certifications

**Safety:** UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending), CCC (GB4943, GB9254, GB17625.1) (Pending)

**EMC:** EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

**Marine:** IEC 60945 4th. (Pending), IACS-E10 (Pending)

**Green Product:** RoHS, cRoHS, WEEE

### Reliability

#### MTBF (mean time between failures):

- Telcordia (Bellcore) Standard TR/SR: 269,934 hrs
- MIL-HDBK-217 FN2: 114,305 hrs



## Hardware Introduction

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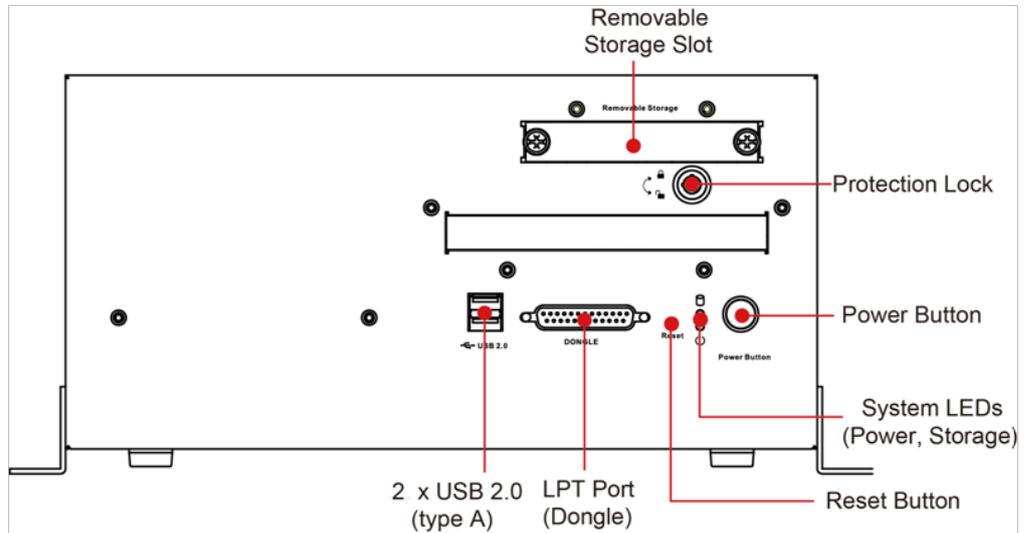
The MC-7130-MP computer is compact, well-designed, and built rugged enough for industrial applications. LED indicators help you monitor performance and identify trouble spots, multiple serial ports allow you to connect different devices, and the reliable and stable hardware platform lets you devote your attention to developing your applications.

The following topics are covered in this chapter:

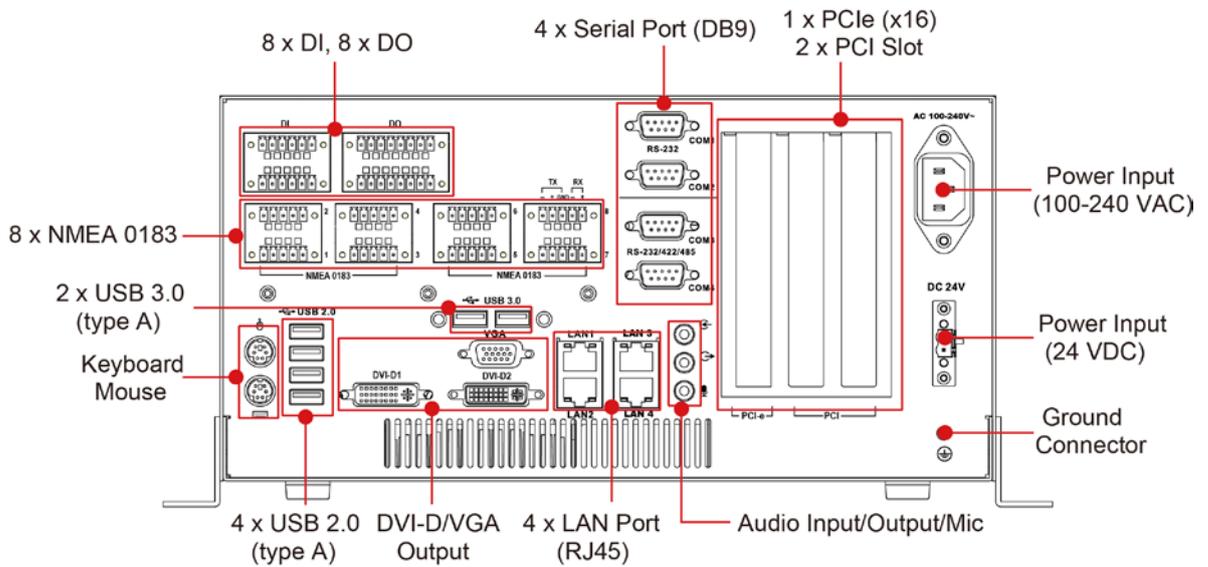
- ❑ **Appearance**
  - Front View
  - Rear View
- ❑ **Dimensions**
- ❑ **LED Indicators**
- ❑ **Real Time Clock**

# Appearance

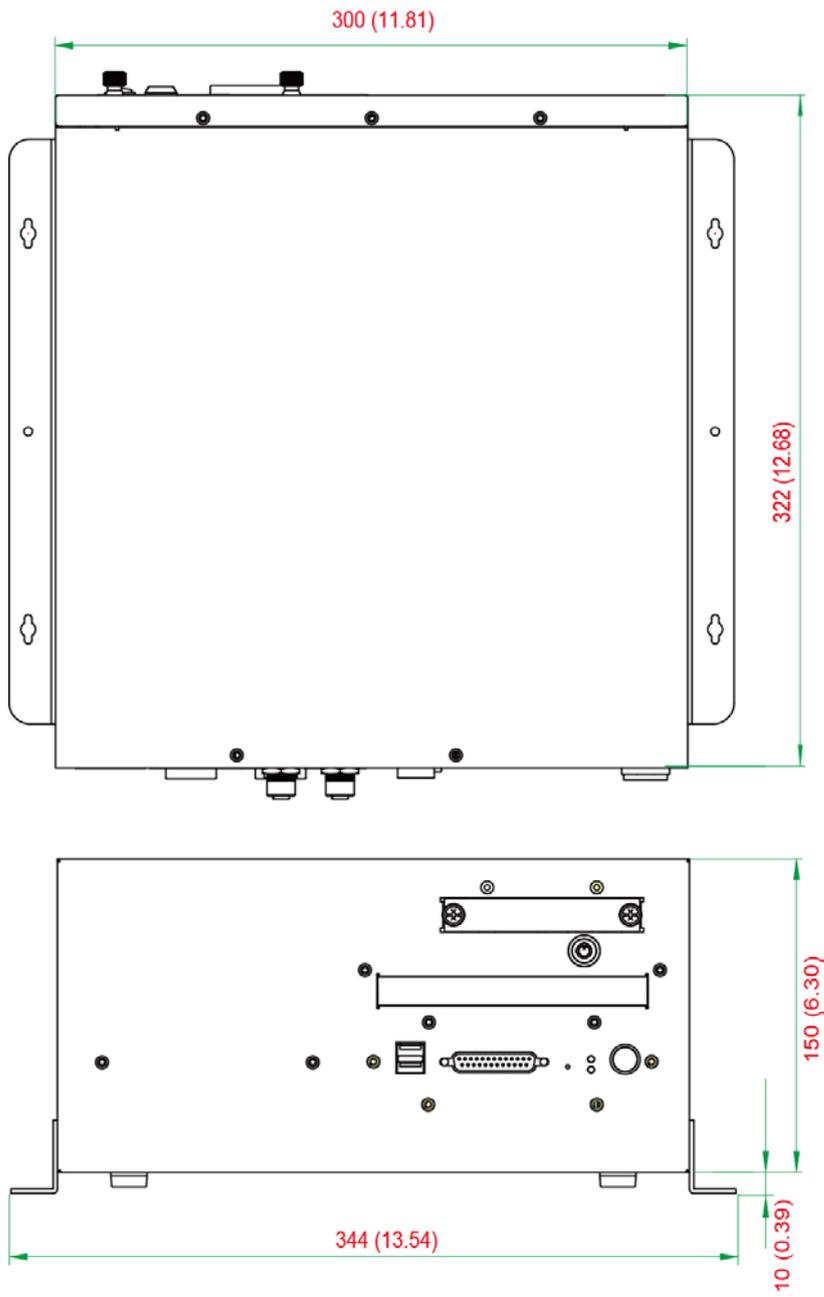
## Front View



## Rear View



# Dimensions



## LED Indicators

LED Name	LED Color	LED Function
Power (on front panel) 	Green	Power is on and functioning normally
	Off	Power is off or power error exists
Storage (on front panel) 	Red (on)	Storage disk is functioning properly
	Red (blinking)	Storage disk is accessing data
	Off	No activity
LAN (1 to 4) (on connectors)	Green	100 Mbps Ethernet mode
	Yellow	1000 Mbps (Gigabit) Ethernet mode
	Off	No activity or 10 Mbps Ethernet mode

## Real Time Clock

The embedded computer's real-time clock is powered by a lithium battery. We strongly recommend that you **NOT** replace the lithium battery on your own. If the battery needs to be changed, contact the Moxa RMA service team at [http://www.moxa.com/rma/about\\_rma.aspx](http://www.moxa.com/rma/about_rma.aspx).



### ATTENTION

Used batteries are environmentally hazardous materials. Dispose of them in the proper manner.



### WARNING

There is a risk of explosion if the wrong type of battery is used. To avoid this potential danger, always be sure to use the correct type of battery. Contact the Moxa RMA service team if you have any questions about replacing your battery.

# Hardware Connection Description

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In this chapter, we show how to connect the embedded computers to the network and to various devices.

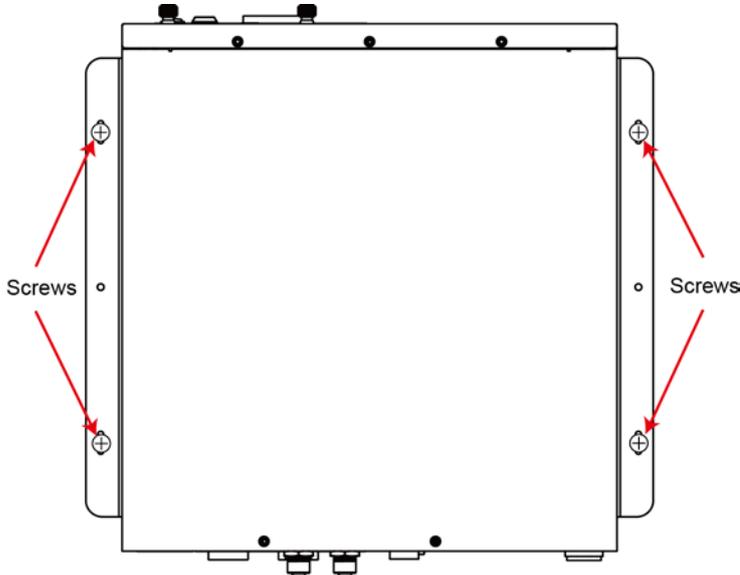
The following topics are covered in this chapter:

- ❑ **Installing the MC-7130-MP**
- ❑ **Wiring Requirements**
- ❑ **Connecting the Power**
- ❑ **Grounding the MC-7130-MP**
- ❑ **Connecting Data Transmission Cables**
  - Connecting to the Network
  - Connecting to a Serial Device
- ❑ **Connecting a PS/2 Keyboard and Mouse**
- ❑ **Connecting to the USB Device**
- ❑ **Connecting to Digital Input and Output Channels**
- ❑ **Connecting to a VGA Monitor**
- ❑ **Connecting to a DVI-D Monitor**
- ❑ **Connecting to a Speaker/Headphone/Microphone**
- ❑ **Installing the Removable SATA Storage Drive**
- ❑ **Installing the Internal SATA Storage Drive**
- ❑ **Installing PCI and PCIe Cards**
- ❑ **Upgrading the Memory Module**

# Installing the MC-7130-MP

## Wall or Cabinet Mounting

The MC-7130-MP provides two brackets for mounting, either onto walls or into cabinets. Attach the brackets with the screws included on both sides of the chassis.



## Wiring Requirements

You should read and follow these common safety precautions before proceeding with the installation of any electronic device:

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

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

- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is advisable to label the wiring on all devices in the system.



### **ATTENTION**

#### **Safety First!**

Be sure to disconnect the power cord before installing and/or wiring your MC-7130-MP.

#### **Wiring Caution!**

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

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

#### **Temperature Caution!**

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

## Connecting the Power

The MC-7130-MP comes with a 100 to 240 VAC power input, and also has a 24 VDC power input (via the terminal block). If power is supplied properly, the **Power** LED will light up.

For safety reasons, please use cables with the following specifications:

**Wire range: 14-22 AWG**

**Torque: 7 lb**

## Grounding the MC-7130-MP

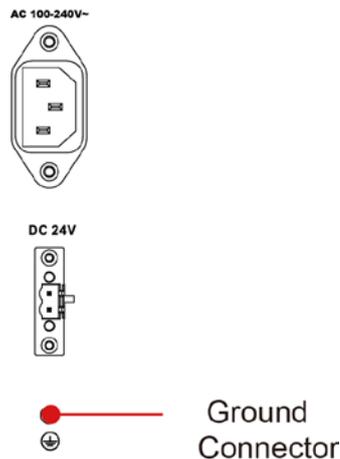
Grounding and careful wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting the power.



### ATTENTION

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

Earthing/Grounding Wire: See the figure shown below for the location of the earth ground on the terminal block power connector. Connect the EG wire to an appropriately grounded metal surface.



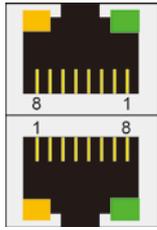
## Connecting Data Transmission Cables

This section describes how to connect the MC-7130-MP computer to the network and/or serial devices.

### Connecting to the Network

Plug your network cable into the computer's Ethernet port. The other end of the cable should be plugged into your Ethernet networking device. When the cable is properly connected, the LEDs on the embedded computer's Ethernet port will glow to indicate a valid connection.

The 10/100/1000 Mbps Ethernet LAN ports use 8-pin RJ45 connectors. The following diagram shows the pinouts for these ports.



The LED indicators on the right-top (for the upper LAN connector) and right-bottom (for the lower LAN connector) corners glow a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

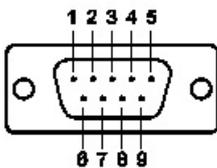
The LED indicators on the left-top and left-bottom corners glow a solid yellow color when the cable is properly connected to a 1000 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0) +
2	ETx-	TRD(0)-
3	ERx+	TRD(1) +
4	---	TRD(2) +
5	---	TRD(2)-
6	ERx-	TRD(1)-
7	---	TRD(3) +
8	---	TRD(3)-

## Connecting to a Serial Device

The serial ports use DB9 connectors. COM1 and COM2 can run with RS-232, and COM3 and COM4 run with RS-232, RS-422, or RS-485. The pin assignments are shown in the following table:

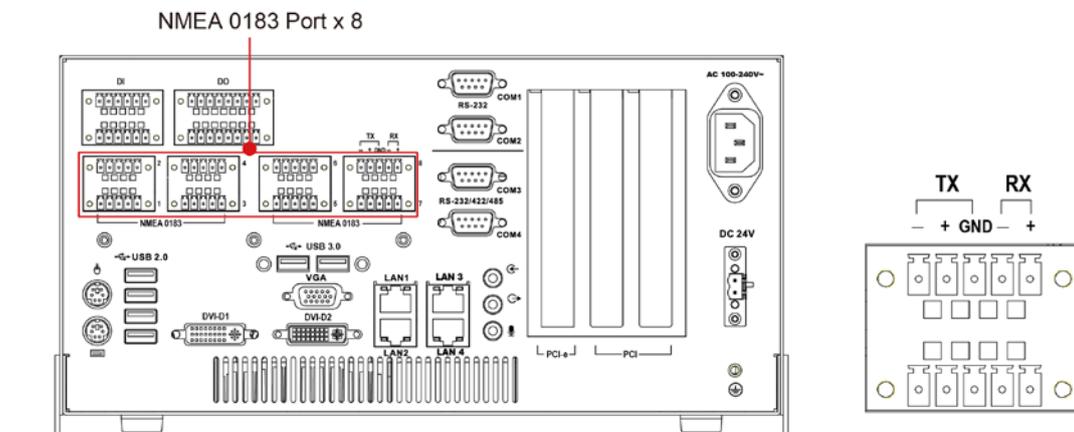
DB9 Male Port



RS-232/422/485 Pinouts

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

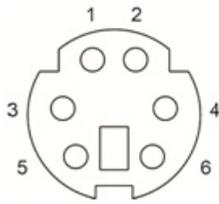
Additionally, eight NMEA serial ports with terminal blocks are also available on the rear panel of the computer. Refer to the following figures for the location of the NMEA ports and the pin assignments.



## Connecting a PS/2 Keyboard and Mouse

Your MC-7130-MP computer comes with 2 PS/2 mini-DIN connectors on the rear panel to connect to a PS/2 keyboard and PS/2 mouse. This 6-pin mini-DIN connector has the pin assignments shown below.

PS/2 Connector



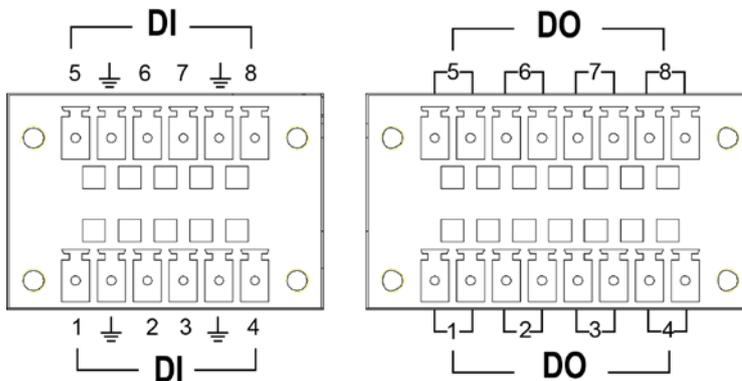
Pin No.	Signal Definition
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	GND
4	VCC
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock

## Connecting to the USB Device

The MC-7130-MP comes with two USB 2.0 hosts on the front panel, four USB 2.0 hosts, and two SuperSpeed USB 3.0 hosts on the rear panel. The USB ports support peripherals such as a keyboard or mouse, or storage devices such as a portable HDD or DVD-ROM. Please note that USB 3.0 interfaces are not supported by the Windows XP platform.

## Connecting to Digital Input and Output Channels

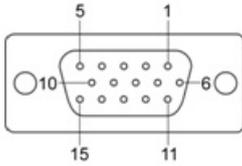
The MC-7130-MP comes with eight digital input and eight digital output channels on the rear panel. These input/output channels can be connected with the terminal blocks which have been included in the package. See the following figure for the pin assignments.



## Connecting to a VGA Monitor

The MC-7130-MP comes with a D-Sub 15-pin female connector on the rear panel to connect a VGA CRT monitor. To ensure that the monitor image remains clear, be sure to fasten the monitor cable using the cable's thumbscrews after connecting it to the MC-7130-MP. The pin assignments of the VGA connector are shown below.

**DB15 Female Connector**

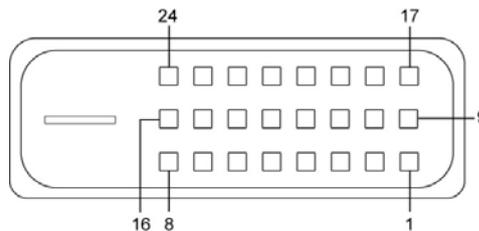


Pin No.	Signal Definition
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC Data
13	HSYNC
14	VS SYNC
15	DDC Clock

## Connecting to a DVI-D Monitor

The MC-7130-MP computers come with two DVI-D connectors that can connect to DVI monitors. Use the cable to connect one end to the DVI-I connector and the other end to the monitor. See the following table for DVI-D connector pin assignments. Please note that three independent displays are not supported under the Windows XP operating system.

**DVI-D Connector**



Pin No.	Signal Definition
1	T.M.D.S. Data2-
2	T.M.D.S. Data2+
3	T.M.D.S. Data2/4 Shield
4	N/C
5	N/C
6	DDC Clock
7	DDC Data
8	Analog Vertical Sync
9	T.M.D.S. Data1-
10	T.M.D.S. Data1+
11	T.M.D.S. Data1/3 Shield
12	N/C

Pin No.	Signal Definition
13	N/C
14	+5V Power
15	Ground (return for +5V, HSync, and VSync)
16	Hot Plug Detect
17	T.M.D.S. Data0-
18	T.M.D.S. Data0+
19	T.M.D.S. Data0/5 Shield
20	N/C
21	N/C
22	T.M.D.S. Clock Shield
23	T.M.D.S. Clock+
24	T.M.D.S. Clock-



# Installing the Internal SATA Storage Drive

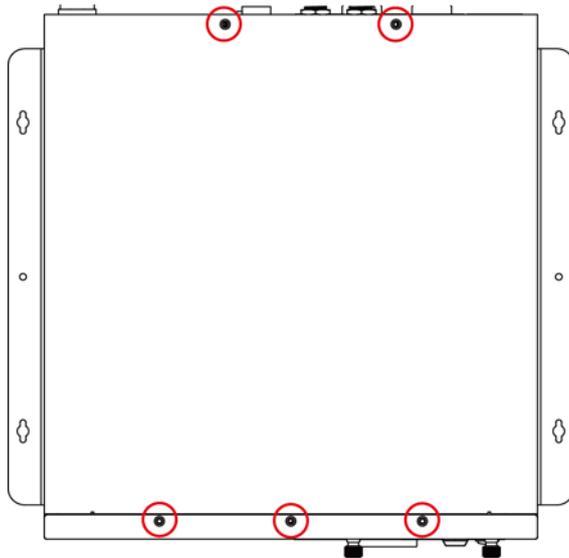
The MC-7130-MP has a SATA connector within the main chassis where a SATA storage drive may be permanently installed. To install a 2.5-inch SATA storage drive, follow these instructions.

Turn over the MC-7130-MP to get access to its bottom panel; remove the four screws on the drive bay cover plate. The following figure shows what the location of the screws:

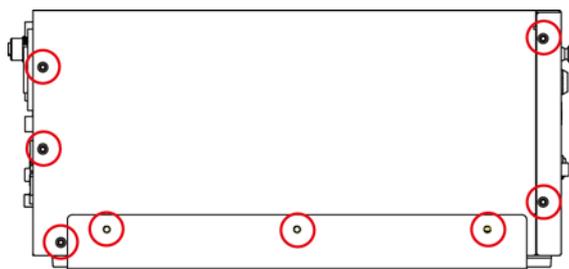
After removing the cover plate, you will need to install the storage drive.

## Removing the Computer Chassis

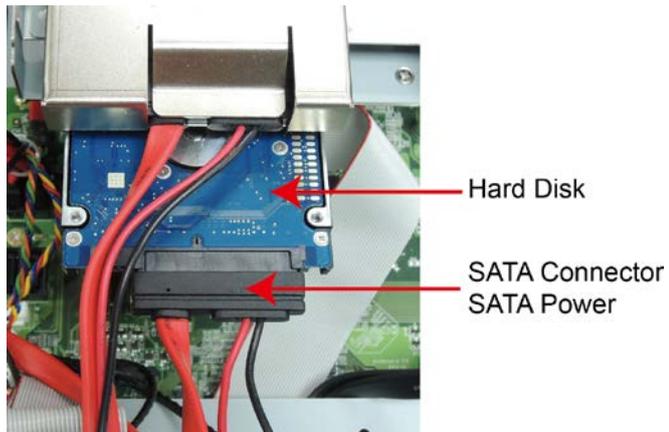
1. Remove the five screws on the top cover of the computer.



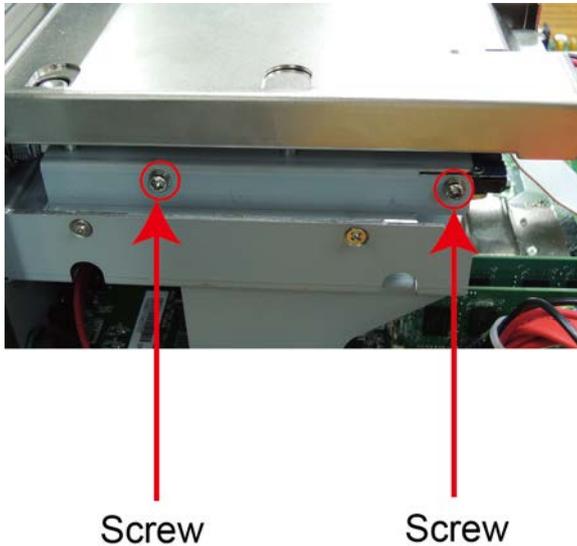
2. Remove the eight screws fastening each side of the computer (16, total).



- The internal drive slot is located below the removable drive slot. Turn the drive so that its connectors are facing towards you and insert it into the slot. Connect the SATA connector and SATA power cable. When finished, push the drive inward.



- Fasten the two screws on either side of the HDD slot.

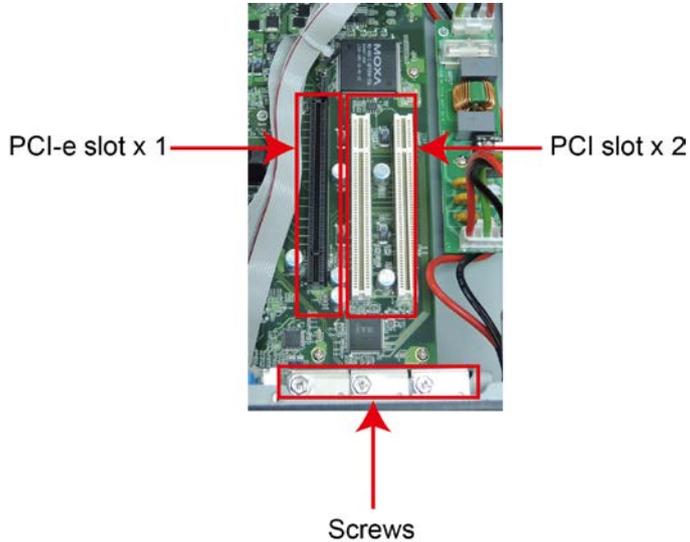


- Remember to replace the top cover on the computer to complete the installation.

# Installing PCI and PCIe Cards

The MC-7130-MP has two universal PCI slots for installing various peripheral cards, such as a RADAR card or PROFIBUS card. Also, a PCIe (x16) card is available for connecting an additional VGA graphic card. To install:

1. Unfasten the computer chassis (see the above section, **Removing the Computer Chassis**).
2. Remove the chassis to expose the PCI slots located in the corner of the computer's motherboard.



3. Remove the screws on the slot protection covers.
4. Insert the PCI card or PCI-e card into the slot, and secure the card to the mounting frame.



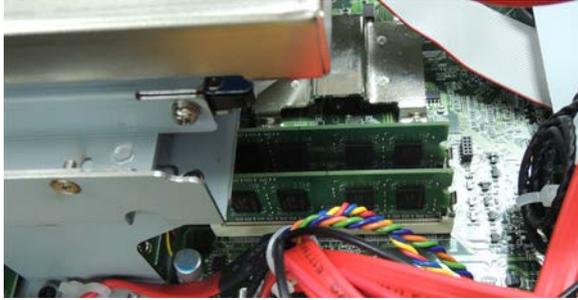
6. When finished, replace the top cover of the computer and complete the installation.

**NOTE** Due to the limitations of Intel architecture, native PCI bus is not available; a PCIe-to-PCI bridge design is required. For some PCI cards this may reduce performance during I/O space access data transfers.

## Upgrading the Memory Module

The MC-7130-MP comes with four gigabytes of pre-installed DDR3 SDRAM, and can support another 12 gigabytes (up to a total of sixteen). If you would like to install more memory modules, please follow the steps below.

1. Remove the cover (see the above section, **Removing the Computer Chassis**).
2. The memory module is located below the internal HDD socket.



3. Simply push the two clutches on both sides of the memory module, and then remove the memory.
4. Carefully slide the module into the clutch at an angle, and then push downward. Make sure the module has been firmly inserted and is oriented correctly.

This chapter describes the BIOS settings of the MC-7130-MP computer. The BIOS is a set of input/output control routines for peripherals. The BIOS is used to initialize basic peripherals and helps boot the operating system before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these basic input/output peripherals.

The following topics are covered in this chapter:

## ❑ **Entering the BIOS Setup Utility**

### ❑ **Main Information**

### ❑ **Advanced Settings**

- Boot Configuration
- Peripheral Configuration
- HDC Configuration
- Video Configuration
- Chipset Configuration
- Hardware Monitor

### ❑ **Security Settings**

- TPM Status
- TPM Operation
- Set Supervisor Password

### ❑ **Power Settings**

- Advanced CPU Control

### ❑ **Boot Settings**

- Boot Type
- Quick Boot
- PXE Boot to LAN
- Add Boot Options
- USB Boot
- EFI Device First
- Boot Delay Time
- Legacy

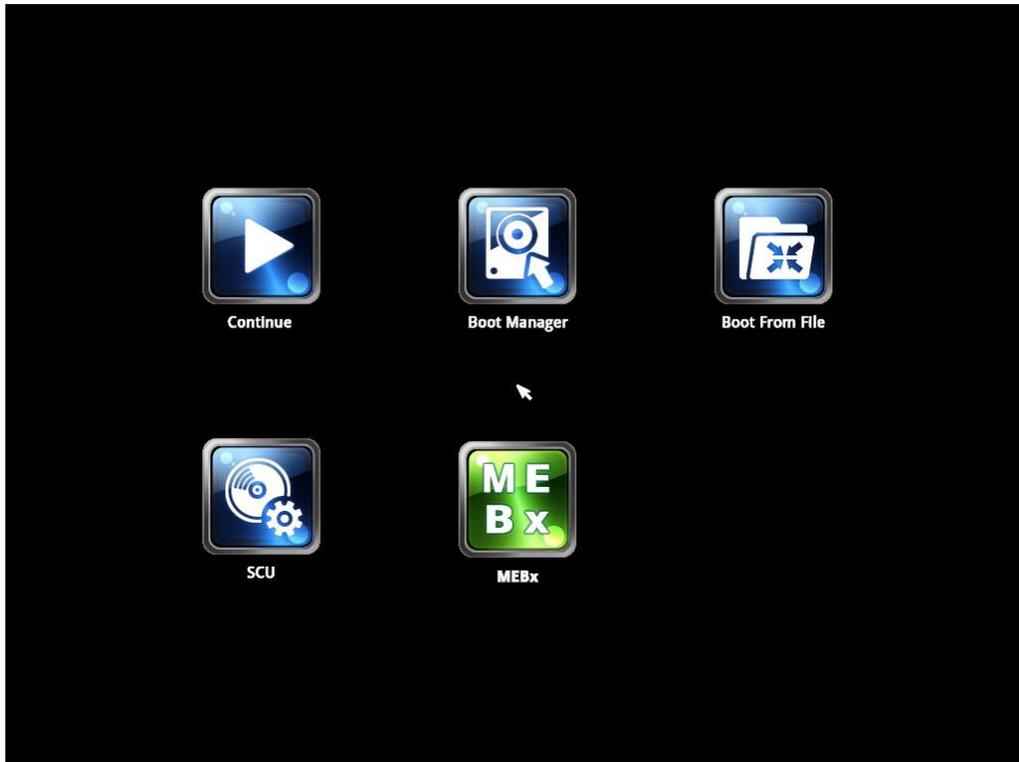
### ❑ **Exit Settings**

- Exit Saving Changes
- Save Change Without Exit
- Exit Discarding Changes
- Load Optimal Defaults
- Load Custom Defaults
- Save Custom Defaults
- Discard Changes

### ❑ **Upgrading the BIOS**

# Entering the BIOS Setup Utility

To enter the BIOS setup utility, press the "F2" key while the system is booting up. The main **BIOS Setup** screen will appear. Select **SCU** to enter the **BIOS configuration**.



A basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to use them.

**F1: General Help**

**F5/F6: Change Values**

**F9: Setup Defaults**

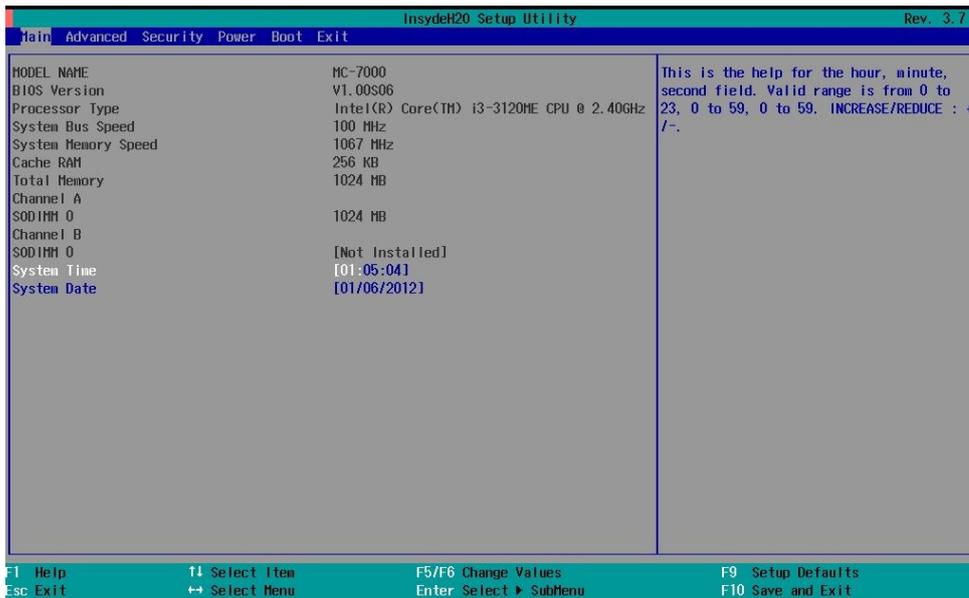
**F10: Save and Exit**

**↑ ↓: Select Item**

**← →: Select Menu**

**ESC: Exit**

**ENTER: Select or go to Submenu.**

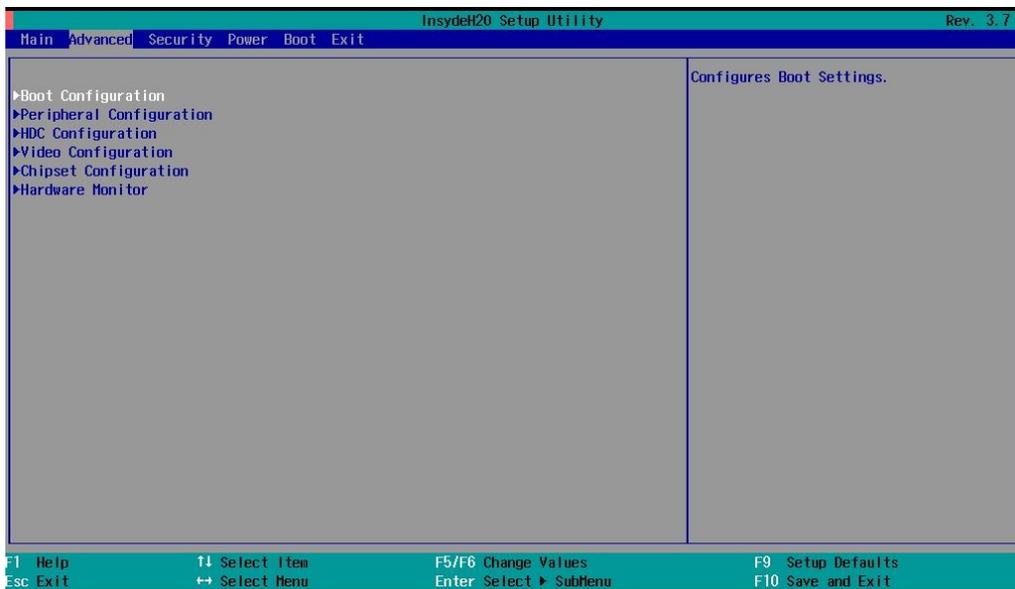


## Main Information

The main page indicates the system information, such as model name, BIOS version, and CPU type. User may view the basic system hardware information in the page.

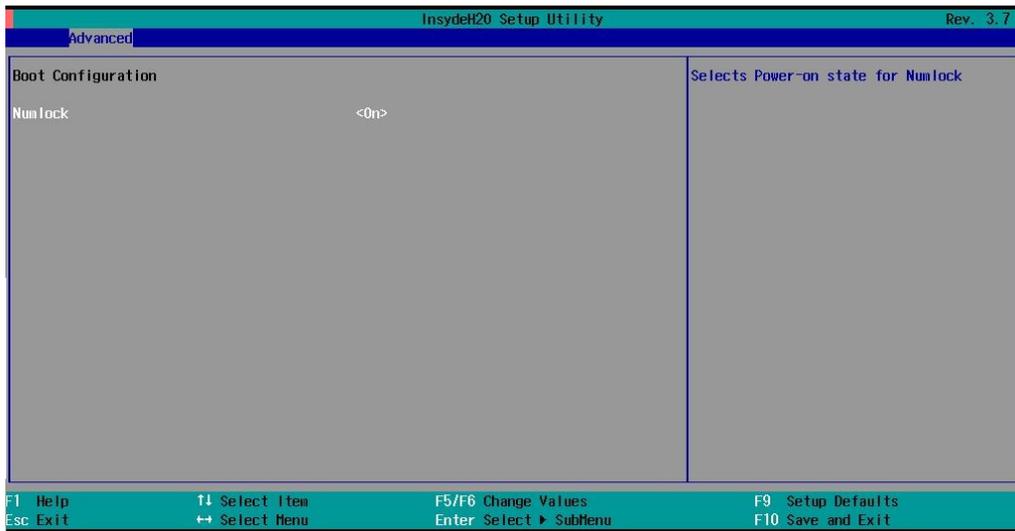
## Advanced Settings

The “Advanced Features” screen will appear when choosing the “Advanced” item from the main menu.



## Boot Configuration

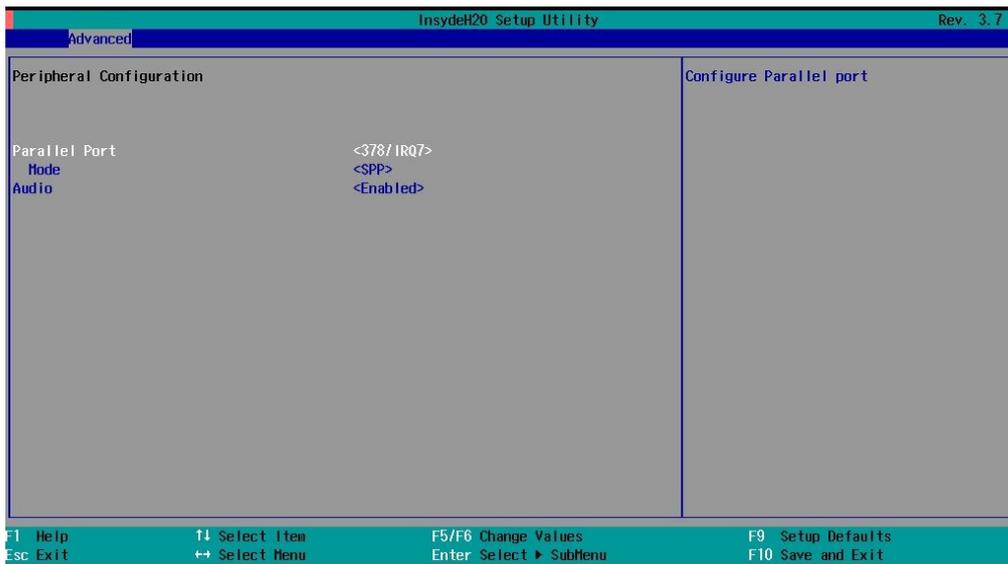
This item allows users to configure the default value of Numlock.



Option: On (default), Off.

## Peripheral Configuration

This item allows you to configure the parallel port and audio device.



### Parallel Port

This item allows you to configure the parallel port.

Options: 378/IRQ7 (default), Disabled

### Mode

This setting allows you to configure the mode for the parallel port.

Options: SPP (default), EPP, ECP, EPP+ECP

### Audio

The item allows you to configure if the system will automatically detect the Audio codec.

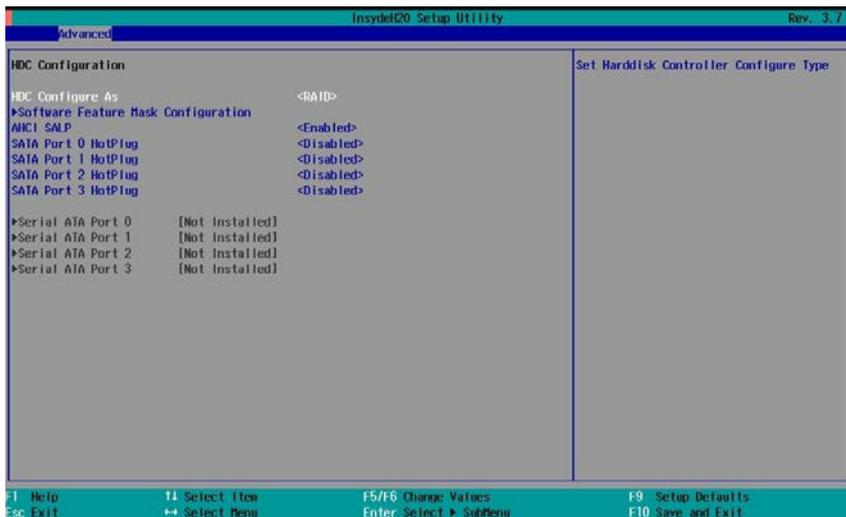
Options: Enabled (default), Disable.

## HDC Configuration

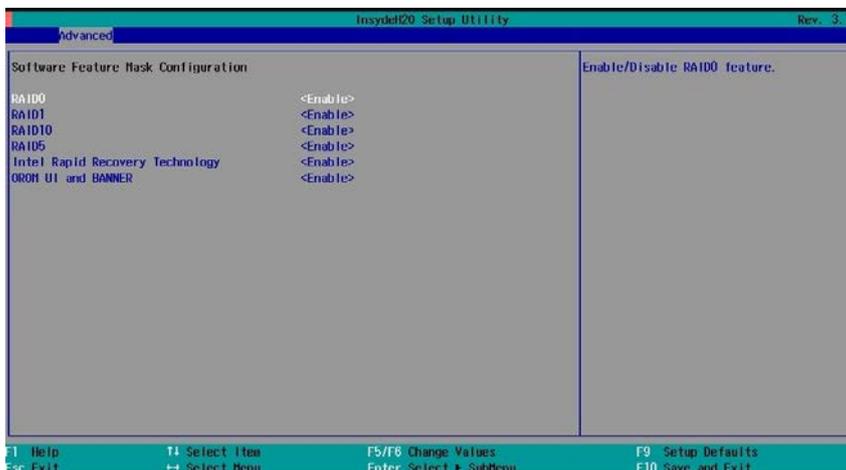
The host drive controller may be configured for IDE (legacy default), AHCI, or RAID mode. When the legacy IDE mode is selected, the following screen will appear.



When RAID mode is selected, the following screen will appear. Select **Software Feature Mask Configuration** to choose which RAID configuration you want to set up.



The **Software Feature Mask Configuration** will appear as below.



**RAID 0** is a simple striping of information across two drives. It offers marginal improvements in access times for substantial sacrifices in system reliability.

**RAID 1** offers full data redundancy across two drives, providing significant improvements in data security and system reliability.

**RAID 10** offers the best of both **RAID 0** and **RAID 1**, using four drives to give moderate improvements in disk access times, but with full mirroring of each drives on two more backup drives to provide full data redundancy and backup.

**RAID 5** is a three-disk-or-more array where data is striped and parity is distributed and reduplicated across all drives. This enables the array to sustain the failure of one of the drives without the loss of any data, and without the array going down. However, with the loss of any single drive the array performance will decrease. Also, when configuring a **RAID 5** architecture, remain aware of the potential for encountering the RAID 5 write hole problem, and take precautions against it.

## Serial ATA Port 0 to 3

This setting allows the user to display information about the installed drives.

## AHCI SALP

Please note that AHCI SALP will only appear when AHCI mode is selected. This item allows you to enable aggressive **link power management** (SALP) in AHCI. SALP enables the host bus adapter to conserve power by directly detecting when a SATA drive is no longer processing information and then immediately shifting it into suspended or sleep modes without waiting for software processes to initiate power-down processes. Host Capability Register bit 26.

Options: Enabled (default), Disabled

## SATA Port 0 to 3 - HotPlug

This item allows you to enable/disable hotplug capabilities (the ability to remove the drive while the computer is running) for installed storage drives.

Options: Disable (default), Enabled

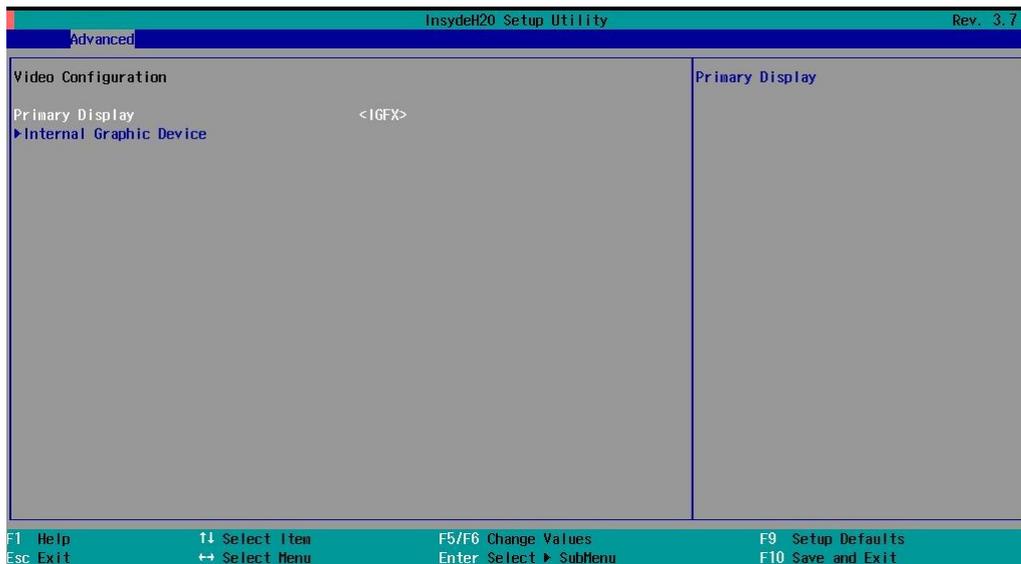
## Video Configuration

This item allows you to configure the integrated graphics device (IGD) for things like memory allocation (**DVMT**) and monitor types (**Boot Type**).

## Primary Display

This item allows you to select the primary display source.

Options: IGFX (default), PEG



## Internal Graphics Device

This option allows you to enable/disable the internal graphics device.

Options: Enable (default), Disable

## IGD—DVMT Pre-Allocated

This item allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

Options: 64 MB (default), 32 MB, 96 MB, 128 MB, 256 MB, 512 MB

**DVMT** is a BIOS solution where “the optimum amount of memory is dynamically allocated and de-allocated as needed for balanced graphics and system performance, through Intel® Direct AGP and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available system memory resources for maximum 2D/3D graphics performance.

## IGD—DVMT Size

This item allows you to configure the maximum amount of memory DVMT will use when allocating additional memory for the internal graphics device.

Options: 256 MB (default), 128 MB, Max

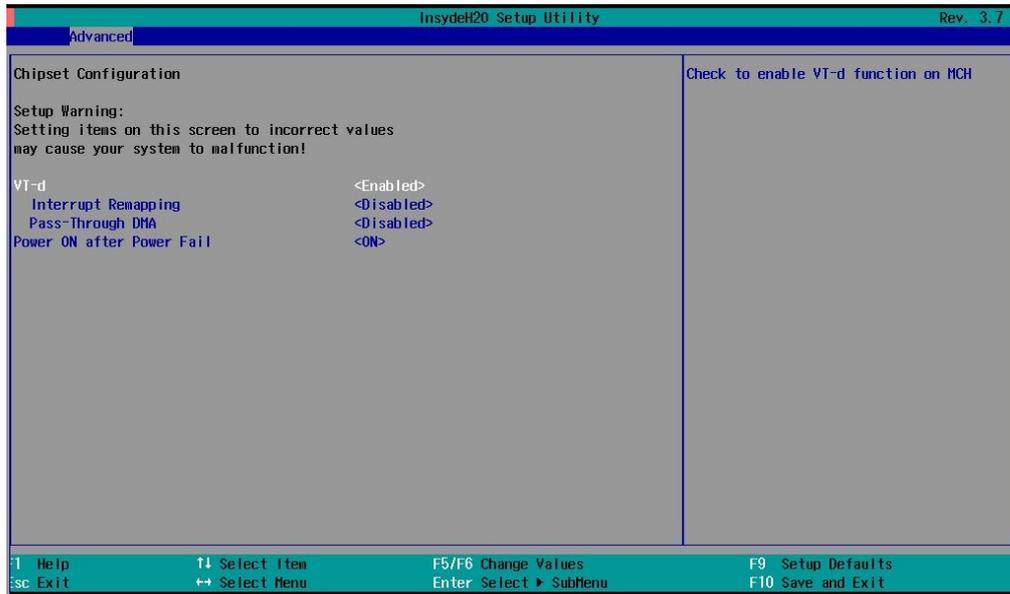
## IGD – Boot Type

This item allows you to select the video device which will be activated during POST.

Options: VBIOS Default (default), VGA, DVI-D2, DVI-D1

## Chipset Configuration

This item allows you to configure the chipset settings.



### VT-d

This item allows you to enable/disable the **VT-d** function.

Options: Enable (default), Disable

### Interrupt Remapping

This item allows you to remap interrupts to different address to resolve interrupt conflicts.

Options: Disable (default), Enable

### Pass-Through DMA

This item allows you to enable/disable **Pass-Through DMA** function.

Options: Disable (default), Enable

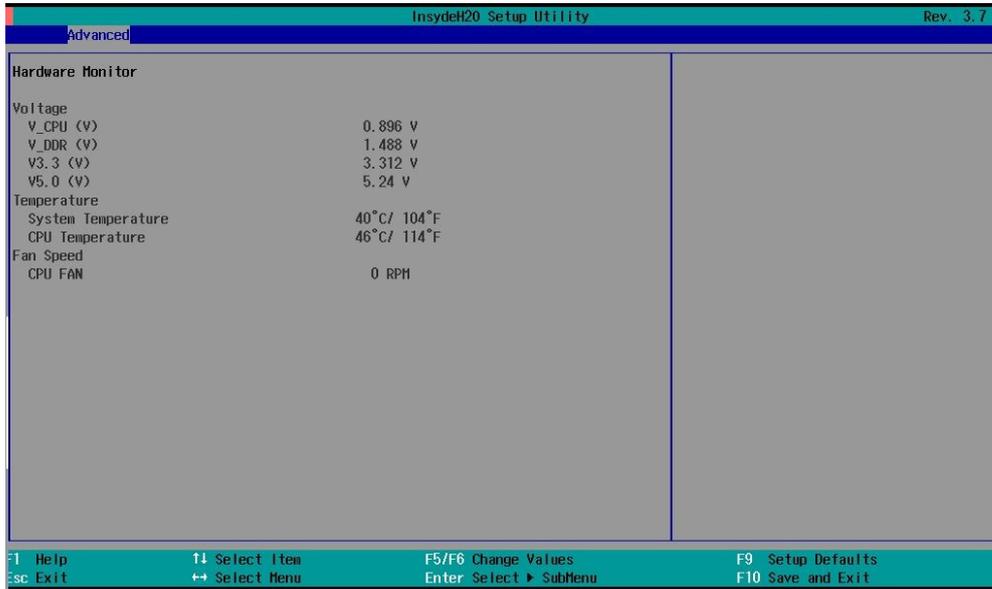
### Power ON after Power Fail

This item allows you to enable/disable the computer from automatically powering up after a system crash.

Options: ON (default), OFF, Last State

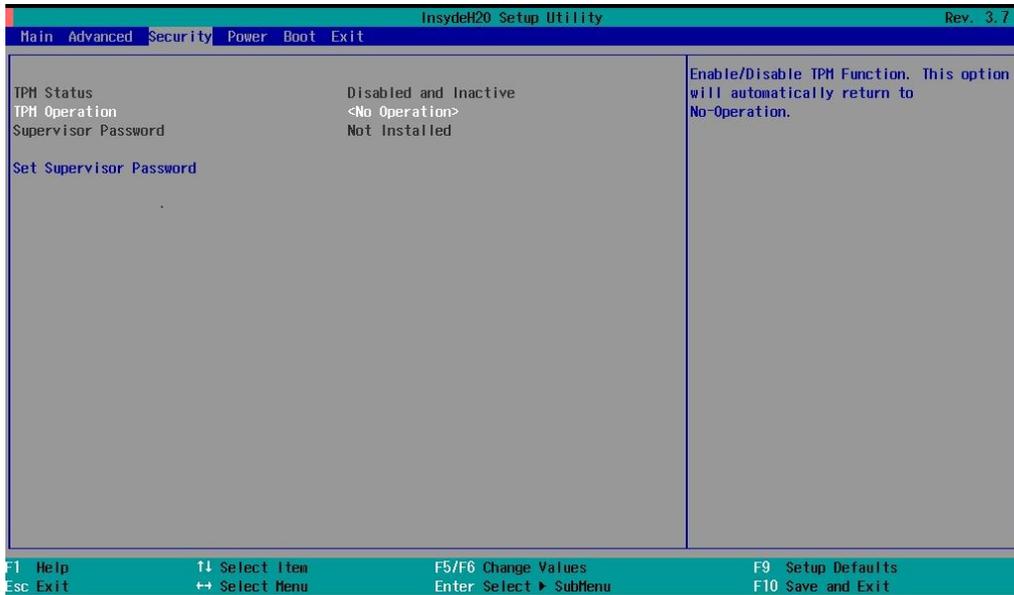
## Hardware Monitor

This item allows you to view stats like CPU and system temperature, voltage levels, and other chipset information. Please note that the CPU fan will not start until the temperature is above 80 degrees Celsius.



## Security Settings

This section allows users to configure security settings with a supervisor password and user password.



### TPM Status

This item allows you to view the TPM status..

### TPM Operation

This item allows you to enable/disable the TPM Operation function.

Options: No Operation (default), Enable and Active, Disable and Deactivate

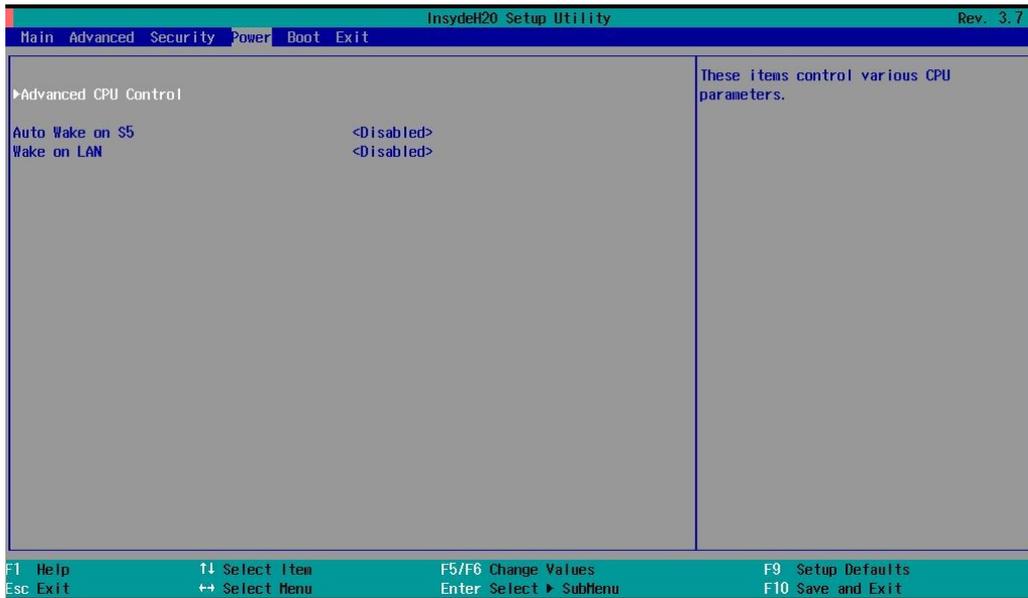
## Set Supervisor Password

This item allows you set the supervisor password. Select and then enter the password, and then confirm the password again.

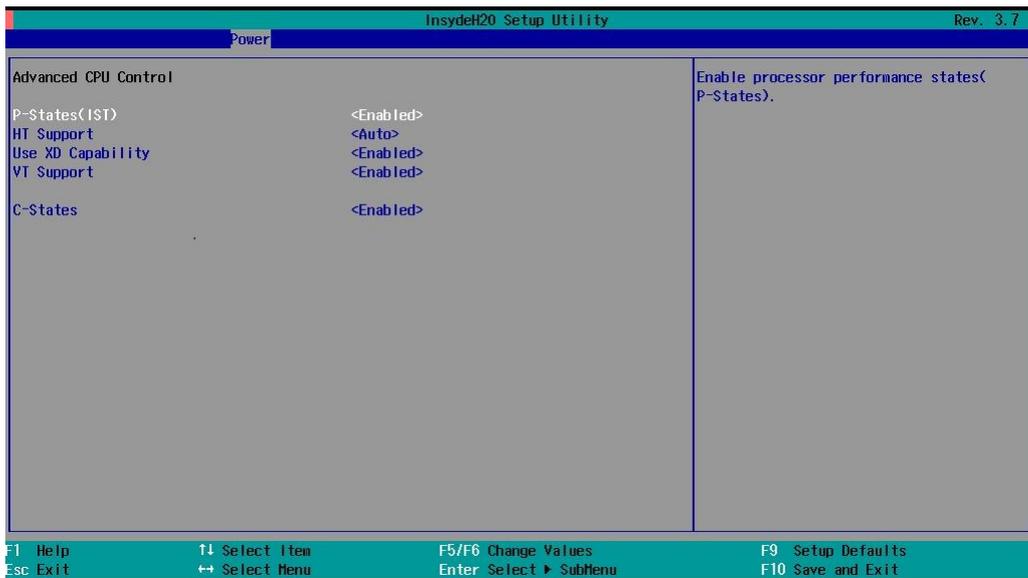
To delete the password, enter **Set Supervisor Password** and then enter the old password; then, leave the new password fields blank, and press enter.

## Power Settings

The section allows users to configure power settings.



## Advanced CPU Control



## P-States (IST)

This item allows you to enable/disable **Processor Performance States** (P-States); these states allow you to choose the speed at which your processor will handle itself, thereby conserving energy during usage, or operating at the top speeds available (while consuming more energy).

Options: Enabled (default), Disabled

## HT Support

This item allows you to disable **Hyper-Threading** (HT).

Options: Auto (default), Disabled

## Use XD Capability

This item allows you to enable **XD** capability—the Execute Disable bit—in the processor. This will prevent the execution of code in data-only memory, giving some protection against buffer overflow attacks. It is recommended to enable this feature; however, some software applications (particularly device drivers) improve performance by executing some of their code from the kernel stack, and in these instances XD will cause page faults. In these cases, **XD** must be disabled.

Options: Enabled (default), Disabled

## VT Support

This item allows you to enable/disable Intel® **Virtualization Technology**, which gives additional hardware support when the system is running virtual operating systems.

Options: Enabled (default), Disabled

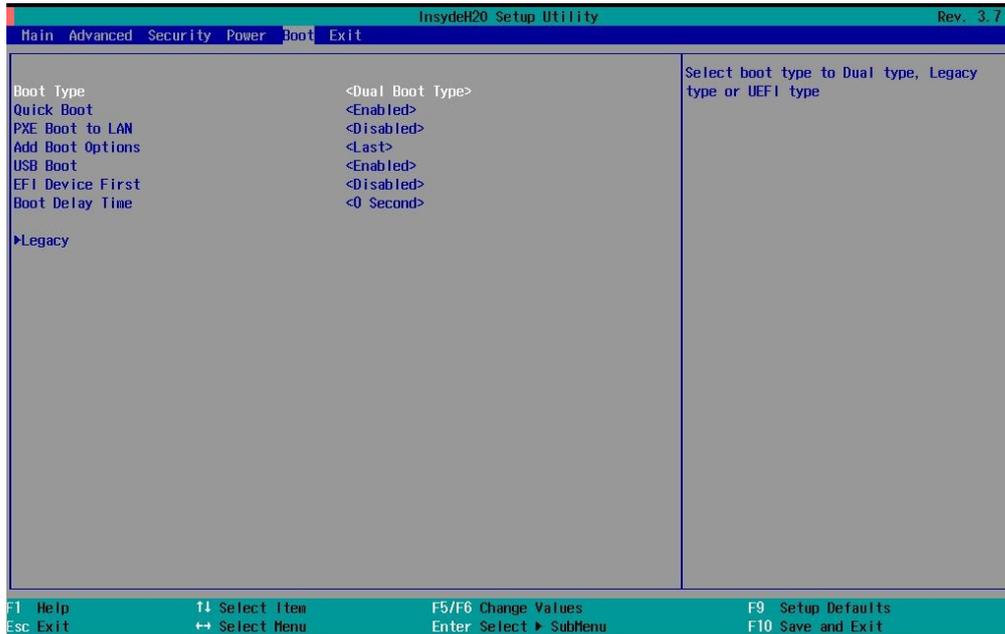
## C-States

This item allows you to enable/disable the processor idling states; these C-States conserve energy when the processor is not being used (or not being fully used). This saves considerable energy when the system is idling, but at the cost of a slow wakeup for the system when it has been idling for a long time.

Options: Enabled (default), Disabled

# Boot Settings

The section allows users to configure boot settings.



## Boot Type

This item allows you to enable/disable quick boot function.

Options: Dual Boot Type (default), Legacy Boot Type, UEFI Boot Type.

## Quick Boot

This item allows you to enable/disable quick boot function.

Options: Enabled (default), Disabled

## PXE Boot to LAN

This item allows you to enable/disable PXE boot to LAN function.

Options: Disabled (default), Enabled

## Add Boot Options

This item allows you to add the boot order options for shell, network and Removables.

Options: Last (default), First

## USB Boot

This item allows you to enable/disable USB boot function..

Options: Enabled (default), Disabled

## EFI Device First

This item allows you to determine EFI device first or legacy device first. If enabled, EFI device will be the first; if disabled, legacy device will be the first.

Options: Disabled (default), Enabled

## Boot Delay Time

This item allows you to configure the delay time value for users to input hot key during POST time.

Options: 0 Second (default), 3 Seconds, 5 Seconds, 10 Seconds

## Legacy

### Normal Boot Menu

This item allows you to configure the boot menu.

Options: Normal (default), Advance

### Boot Type Order

This item allows you to select the boot order. Use F5/F6 to change values.

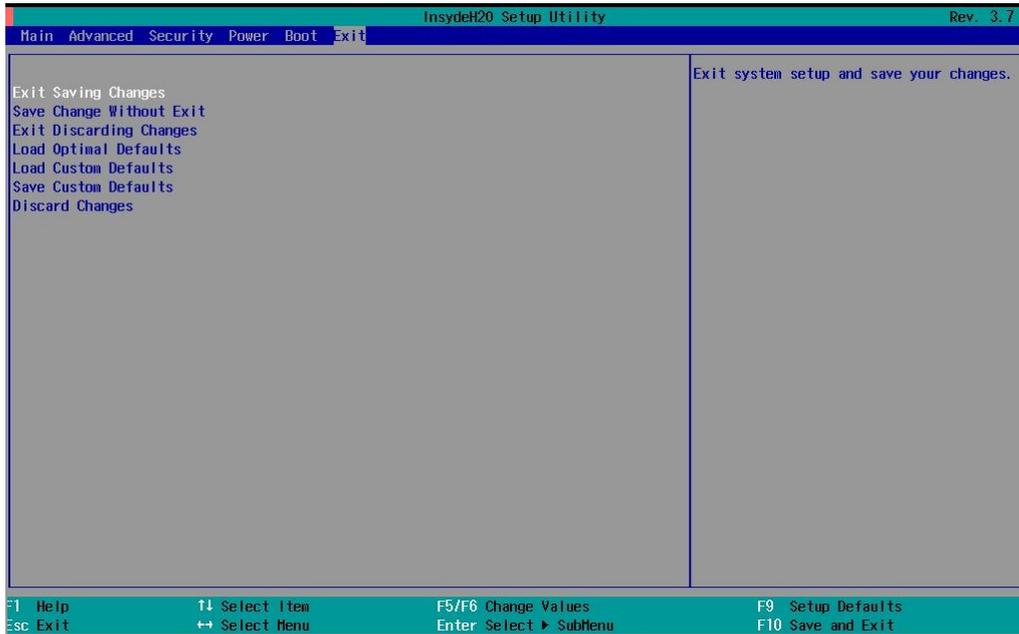
Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, Others

### Hard Disk Drive/USB Drive

This item allows you to view installed devices such as hard disk drives, USB drives, or CD-ROMs. For example, if you have inserted a USB drive into the computer, it will appear here.

# Exit Settings

The section allows users to exit the BIOS environment.



## Exit Saving Changes

This item allows you to exit the BIOS environment and save the values you have just configured.

Options: Yes (default), No

## Save Change Without Exit

This item allows you to save changes without exiting the BIOS environment.

Options: Yes (default), No

## Exit Discarding Changes

This item allows you to exit without saving any changes that might have been made to the BIOS.

Options: Yes (default), No

## Load Optimal Defaults

This item allows you to revert to the factory default BIOS values.

Options: Yes (default), No

## Load Custom Defaults

This item allows you to load custom default values for the BIOS settings.

Options: Yes (default), No

## Save Custom Defaults

This item allows you to save the current BIOS values as a “custom default” that may be reverted to at any time by the “load custom defaults” selection just above.

Options: Yes (default), No

## Discard Changes

This item allows you to discard all settings you have just configured.

Options: Yes (default), No

# Upgrading the BIOS

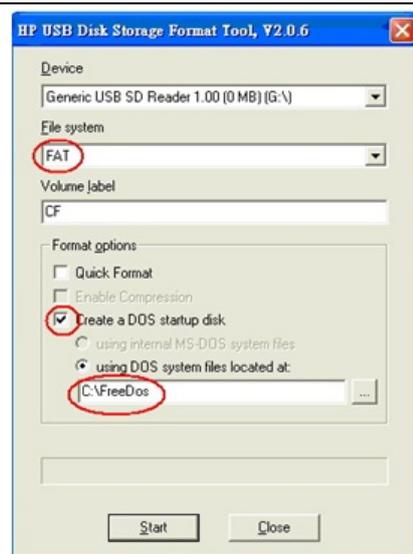
This section describes how to upgrade the BIOS. However, please note that upgrading the BIOS involves high risk of damage to your computer. We strongly recommend that you contact Moxa's TS staff for assistance and obtain all necessary tools and files before attempting to upgrade.

## Step 1: Create a Bootable USB Disk

We suggest you use the HP USB Disk Format Tool to create a bootable USB disk. You may download this tool from the Internet. Search the Internet using the phrase "HP USB Disk Storage Format Tool", and then download the tool from one of the listed websites.

You will also need to download the FreeDOS system files **kernel.sys** and **command.com** from <http://www.freedos.org/kernel/>.

1. Copy DOS system files **kernel.sys** and **command.com** to a specified directory (**C:\FreeDOS** in this example).
2. Start the HP USB Disk Storage Format Tool and select the USB device that you want to use as a bootable disk in the **Device** drop down box.
3. Select **FAT** in the **File system** drop down box.
4. Type the disk name in the **Volume label** field.
5. Check the option **Create a DOS startup disk** under format options.
6. Specify the directory of the system files (for example, **C:\FreeDOS**).
7. Click **Start** to format and create the USB disk.



### ATTENTION

We suggest you use a USB drive with under 2 GB in disk space, as larger USB drives may not support FAT file format and consequently fail to boot.

## Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.

1. Get the BIOS upgrade installation file. The file name should have following format: **MC71xxSxx.exe** (xx refers to version numbers).
2. Copy the file to the Bootable USB Disk.

## Step 3: Run the upgrade program on the MC-7130-MP Computer

1. Reboot the computer, press F12 while booting up to go to the Boot Manager
2. Select USB Disk as the first boot source. Press Enter to continue.



- When boot up finishes, DOS screen will show up. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the MC\_7130 folder, type `cd MC_7130`

```
C:\>cd MC_7130
```

- Run the upgrade program by typing `MC7130S03.exe`. Please note that the upgrade filename may vary depending on the versions.

```
C:\ MC_7130>MC7130S01.exe
```

- The upgrade program will be automatically performed. Please wait until the procedure to be finished.

```
C:\>70010s06
Reading file...
Flash package mode.
Option: -BIOS -C -Desc -ME
```

**Please do not remove the AC power!**

Insyde Flash Utility for InsydeH20  
Version 1.5t

Initializing

```
Current BIOS Model name: MC-7000
New      BIOS Model name: MC-7000
```

```
Current BIOS version: V1.00S06
New      BIOS version: V1.00S06
```

Updating Block at FFDE8000

- When the upgrade is finished, the computer will automatically reboot. You may check the BIOS version in Main page of the BIOS Setup

MODEL NAME	MC-7130
BIOS Version	V1.00S06
Processor Type	Intel(R) Core(TM) i3 CPU 3120ME @ 2.40GHz



**ATTENTION**

Do NOT switch off the power supply during the BIOS upgrade, since doing so may cause the system to crash.

# A

## Regulatory Approval Statement

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This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Class A:** FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



European Community

**Warning:**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## Adjusting the Audio Mixer Function

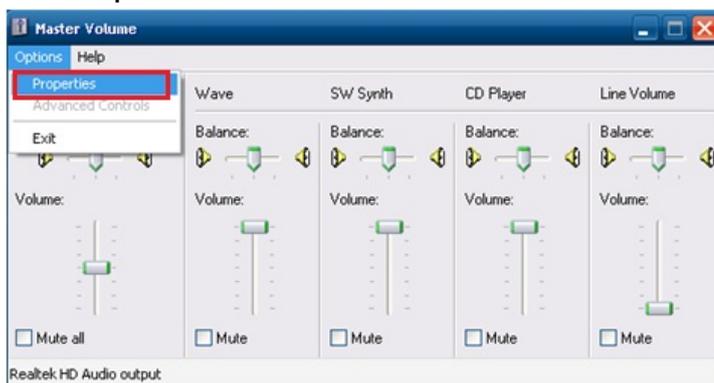
This chapter describes how to adjust the of the MC-7130-MP's audio settings for the **Mixer** function in the Windows XP and Windows XP Embedded operating systems.

Since the **Mixer** function is enabled by default, you need modify the default settings of the Realtek audio device so that sounds picked up from the microphone will not be recorded. Follow the steps below:

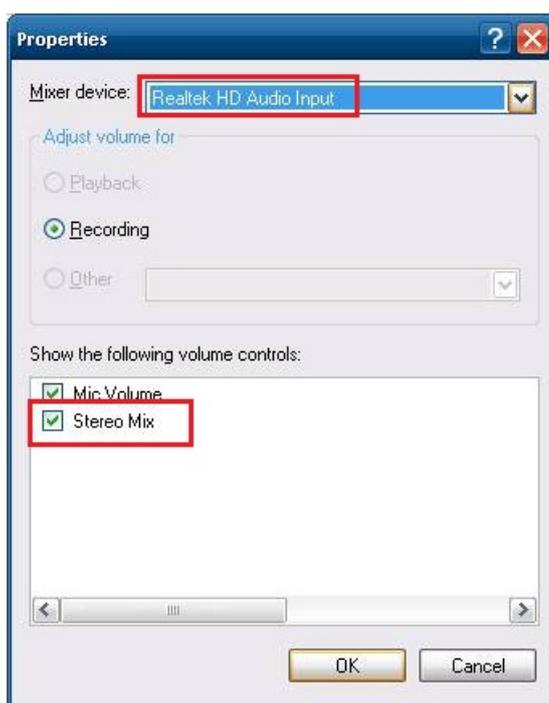
1. Right-click volume icon and select **Open Volume Control**.



2. Select **Properties**.



3. Select **Realtek HD Audio Input** from the Mixer device drop-down list, and check **Stereo Mix**. Click **OK** to continue.



- 4. Uncheck **Stereo Mix** and choose **Mix Volume** to complete the configuration.

