

MC-7270-MP-T User's Manual

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www.moxa.com/product

MOXA®

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MC-7270-MP-T User's Manual

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1

Introduction

The chapter describes the product overview, package checklist, product features, and hardware specifications of the MC-7270-MP-T marine computer.

The following topics are covered in this chapter:

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

Overview

The Moxa MC-7270-MP-T marine computer is powered by the third generation Intel® Core™ i CPU processor and offers a wide temperature design for use in critical environments. The MC-7270-MP-T provides a full range of I/O connectivity that includes eight NMEA 0183 ports, four serial ports, four Gigabit Ethernet ports, as well as 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-7270-MP-T'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 or Windows 7 Embedded to provide a flexible and friendly environment for system development and application implementation.

Package Checklist

Each model ships with the following items:

- MC-7270-MP-T marine computer
- 2 removable storage protection keys
- Wall mounting kit, with 8 screws
- 2-pin terminal block for DC power input
- 2-pin terminal block for Power ON/OFF switch
- 2 6-pin digital input terminal blocks
- 2 8-pin digital output terminal blocks
- 8 5-pin terminal blocks for NMEA 0183 ports
- Documentation and driver CD
- Quick installation guide

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

Product Features

The MC-7270-MP-T embedded computer has the following features:

- High performance Intel® Core™ i7 3555LE processor
- Fanless design
- Full marine I/O design
- PCI/PCIe slot
- 3 USB 3.0 and 6 USB 2.0 ports
- 2 removable SATA hard drives
- Dual power: 100 to 240 VAC and 24 VDC
- -40 to 70°C wide operating temperature

Hardware Specifications

Computer

CPU: Intel® Core™ i7-3555LE, dual core 64-bit 2.5 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, with 4 GB pre-installed (2 slots total, with a 4 GB DDR3/DDR3L-1600 204 pin SO-DIMM SDRAM pre-installed in 1 slot)

Storage:

- 2 SATA III 6 Gbps ports for removeable storage tray
- 2 SATA II 3 Gbps ports (internal, for installing optional hard disks)

USB: USB 2.0 hosts x 6, USB 3.0 hosts x 2, Type A connectors

Other Peripherals

Audio: Line in x 1, Line out x 1, Microphone x 1

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

PCI Slots: 2

PCIe x16 Slots: 1

LPT Port: 1

Display

Display Interface:

- VGA Interface x 1: 15-pin D-Sub connector (female), with resolution up to 2048x1536 pixels with 32-bit color at 75 Hz
- DVI-D Interface x 2: 29-pin DVI-D connectors (female), with resolution up to 1920 x1200 pixels with 32-bit color at 60 Hz

Graphics Controller: Onboard Intel® HD 4000 graphics

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 115.2 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

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: 2 A, 30 VDC / 0.5 A, 125 VAC under resistor load

Initial Insulation Resistance: 1000 Mohm (min.) @ 500 VDC

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

Electrical Endurance: 100,000 operations

Contact Resistance: Max. 50 Mohm @ 6 V, 0.1 A

Connector Type: 8-pin Phoenix-compatible 3.81 mm screw terminal blocks 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 (with mounting ears): 320 x 240 x 160 mm (12.6 x 13.39 x 6.3 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)

Storage Temperature: -50 to 80°C (-58 to 176°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 g @ 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 32 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

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

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 Level: -6 V to +6 V (maximal differential level)

Baudrate: 4800 bps

Data Bits: 8

Stop Bits: 1, 1.5, 2

Parity: None

Handshake: None

Standards and Certifications

Safety: UL/cUL, CCC

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

Marine Standards: IEC 60945 4th, IEC 61162, IEC 61174 (Pending)

Marine Type Approvals: DNV 2.4, ABS (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

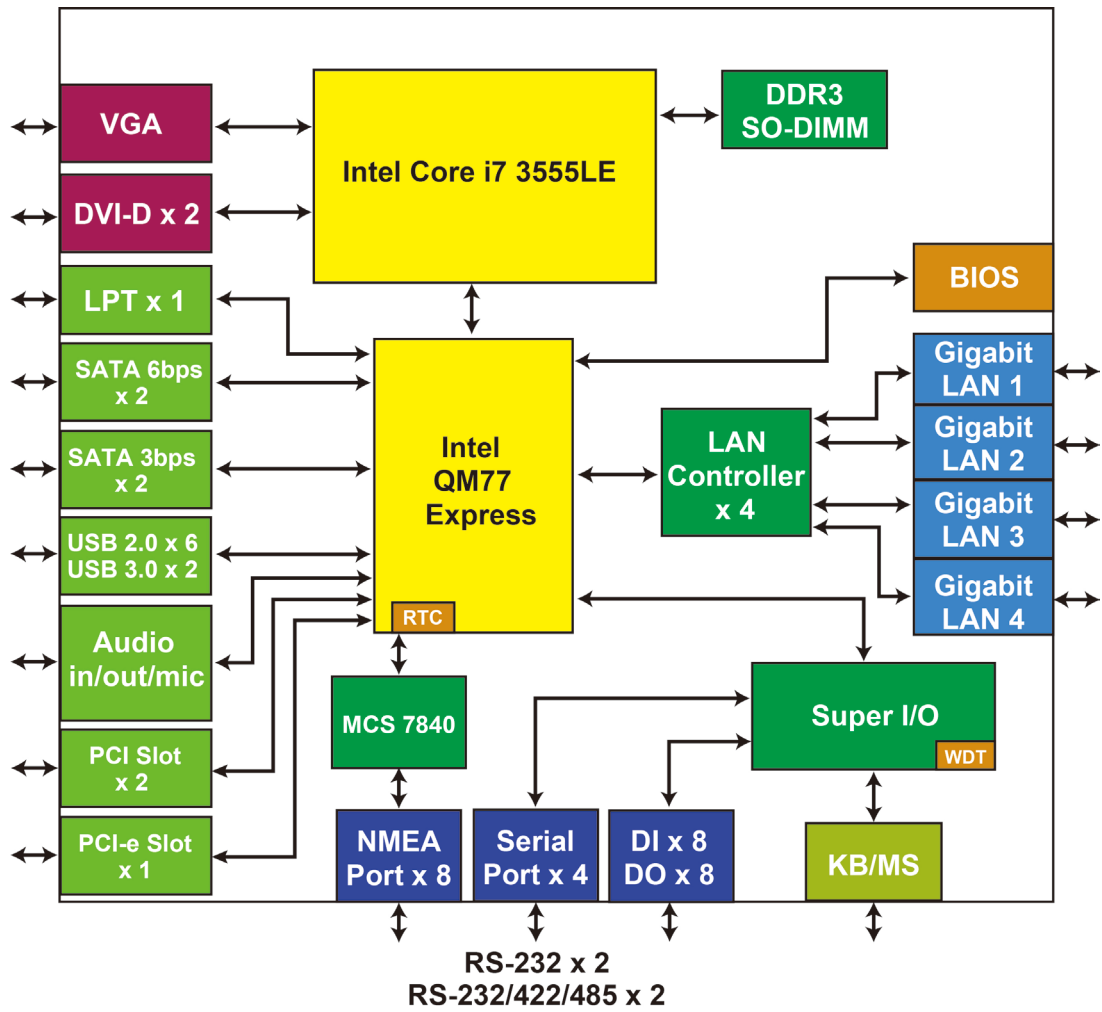
Automatic Reboot Trigger: Built-in watchdog timer (WDT), configurable for resets following 1-255 second hang intervals; software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Hardware Block Diagram



Hardware Introduction

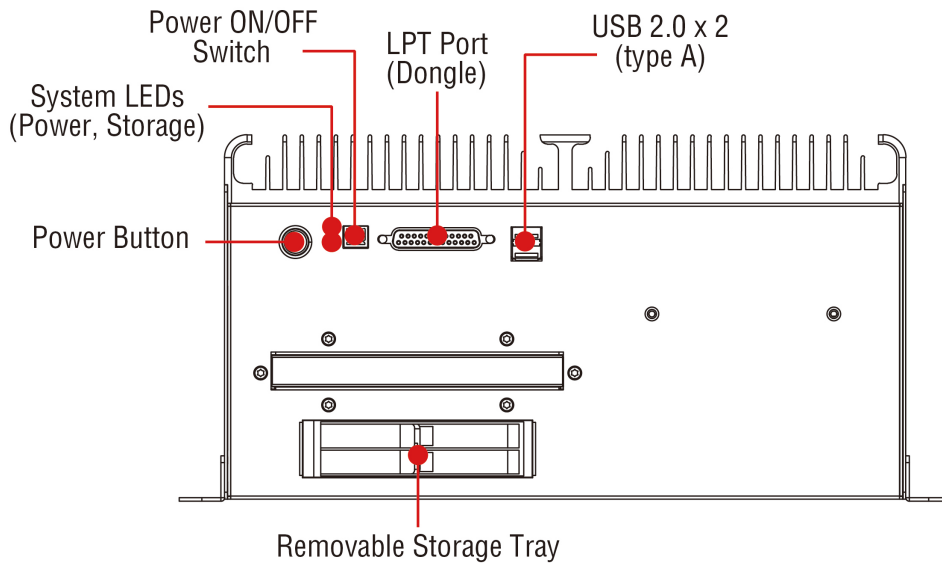
The MC-7270-MP-T computer is compact, well-designed, and built rugged enough for industrial applications. LED indicators help you monitor performance and identify trouble spots, multiple serial ports allow you to connect different devices, and the reliable and stable hardware platform lets you devote your attention to developing your applications.

The following topics are covered in this chapter:

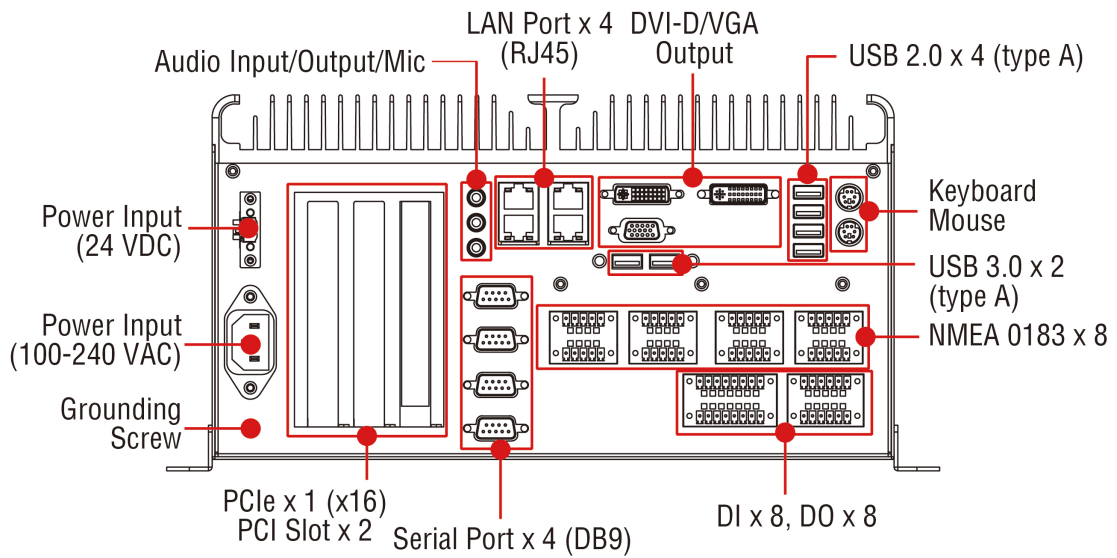
- **Appearance**
 - Front View
 - Rear View
- **Dimensions**
- **LED Indicators**
- **Real Time Clock**

Appearance

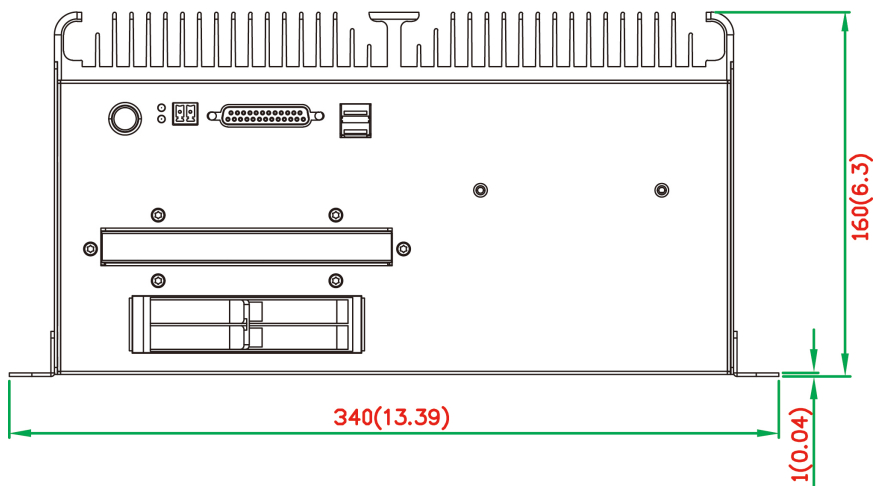
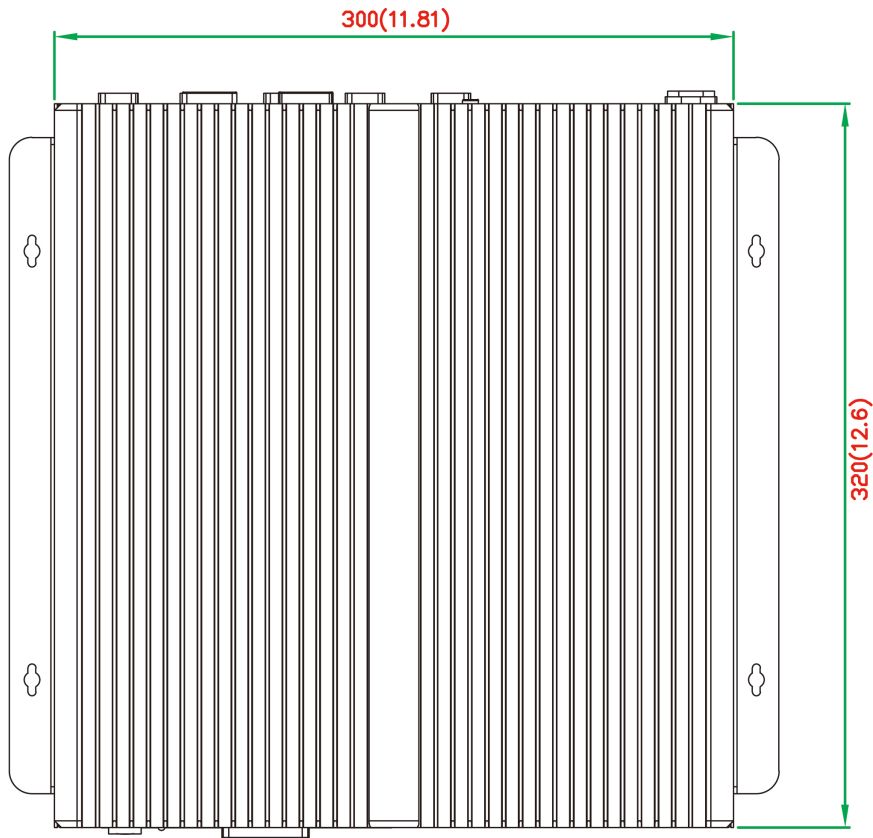
Front View





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
Storage (on storage tray)	Red (on)	Storage disk is functioning properly
	Red (blinking)	Storage disk is being accessed
	Red (off)	No activity
	Blue (on)	w/ SATA power

Real Time Clock

The embedded computer's real-time clock is powered by a lithium battery. We strongly recommend that you do **NOT** replace the lithium battery yourself. If the battery needs to be changed, contact the Moxa RMA service team at http://www.moxa.com/rma/about_rma.aspx.



ATTENTION

Used batteries are environmentally hazardous material. 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

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

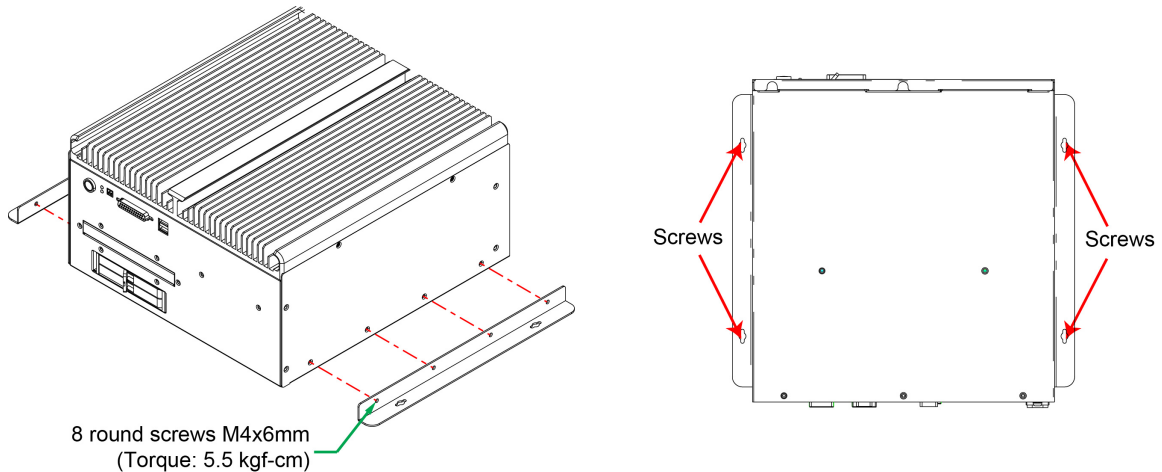
The following topics are covered in this chapter:

- ❑ **Installing the MC-7270-MP-T**
 - Wall or Cabinet Mounting
- ❑ **Wiring Requirements**
- ❑ **Connecting the Power**
- ❑ **Grounding the MC-7270-MP-T**
- ❑ **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**
- ❑ **Installing the Removable SATA Storage Drive**
- ❑ **Installing PCI and PCIe Cards**
- ❑ **Upgrading the Memory Module**

Installing the MC-7270-MP-T

Wall or Cabinet Mounting

The MC-7270-MP-T has brackets for both wall and cabinet mounts. Attach one bracket on each side of the MC-7270-MP-T, and then use suitable screws to attach the brackets to a wall or cabinet.



Wiring Requirements

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-7270-MP-T.

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-7270-MP-T 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 DC terminal block cables with the following specifications:

Wire range: 14-22 AWG

Grounding the MC-7270-MP-T

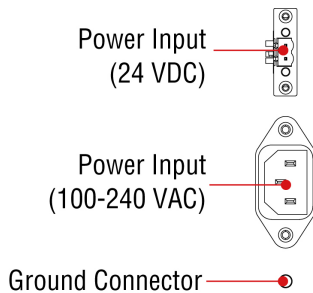
Grounding and careful wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting the power.



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.



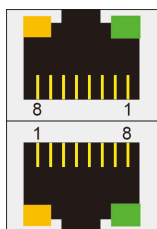
Connecting Data Transmission Cables

This section describes how to connect the MC-7270-MP-T 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.

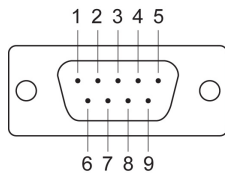
The LED indicators on the left-top and left-bottom corners glow a solid yellow color when the cable is properly connected to a 1000 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

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 support RS-232. COM3 and COM4 support RS-232, RS-422, or RS-485. The AP from the CD can be used to configure both COM1 and COM2. For detailed instructions, please refer to Appendix C. The pin assignments are shown in the following table:

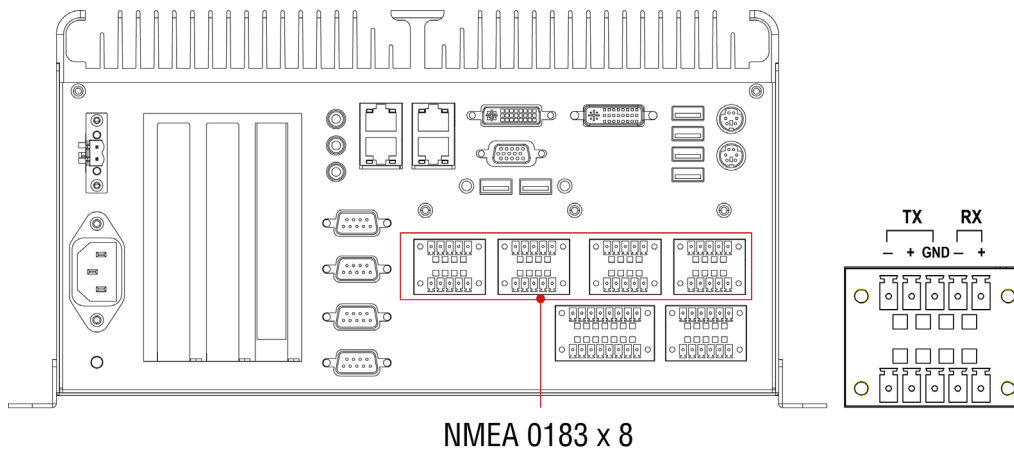
DB9 Male Port



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	-	-	-

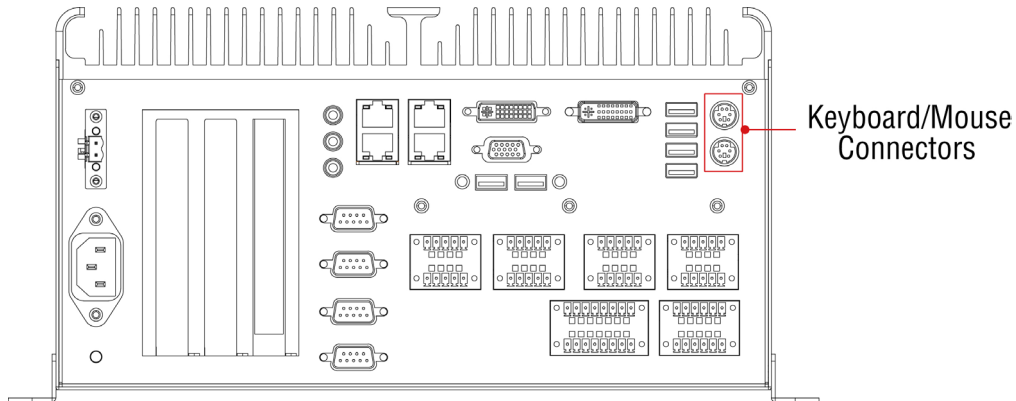
Additionally, eight NMEA serial ports with terminal blocks are also available on the rear panel of the computer. Refer to the following figures for the location of the NMEA ports and the pin assignments.



NMEA 0183 x 8

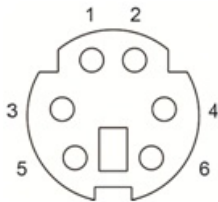
Connecting a PS/2 Keyboard and Mouse

Your MC-7270-MP-T 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.

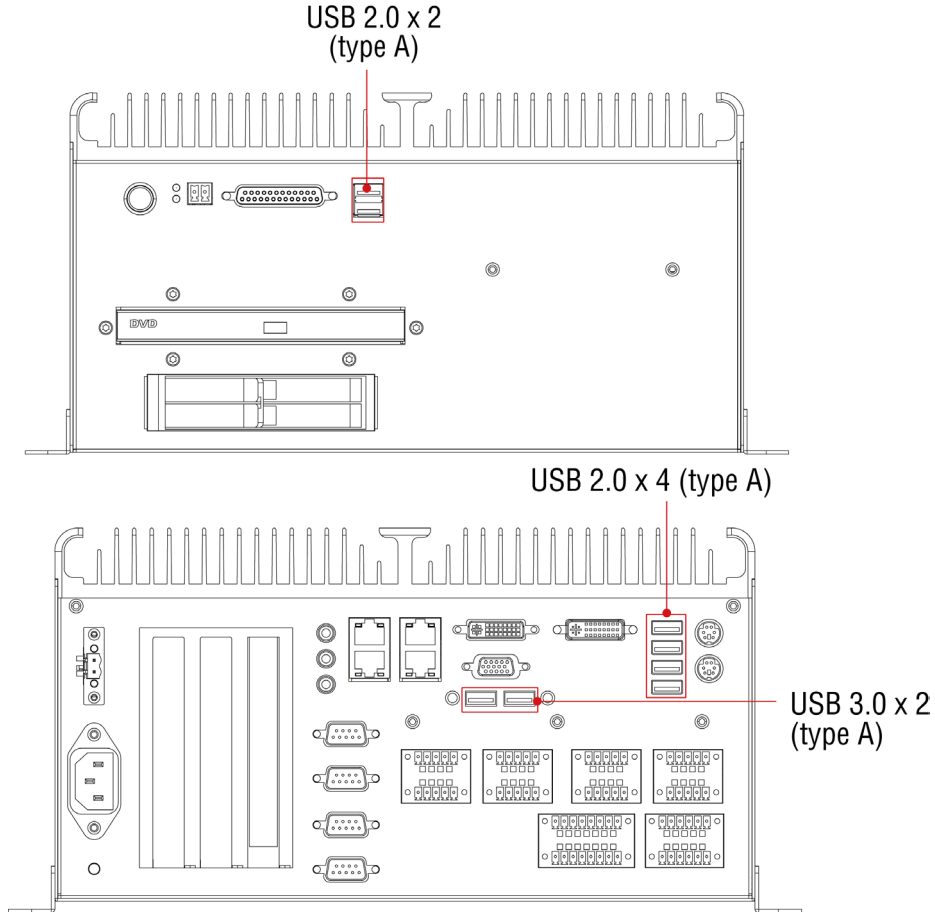
PS/2 Connector



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

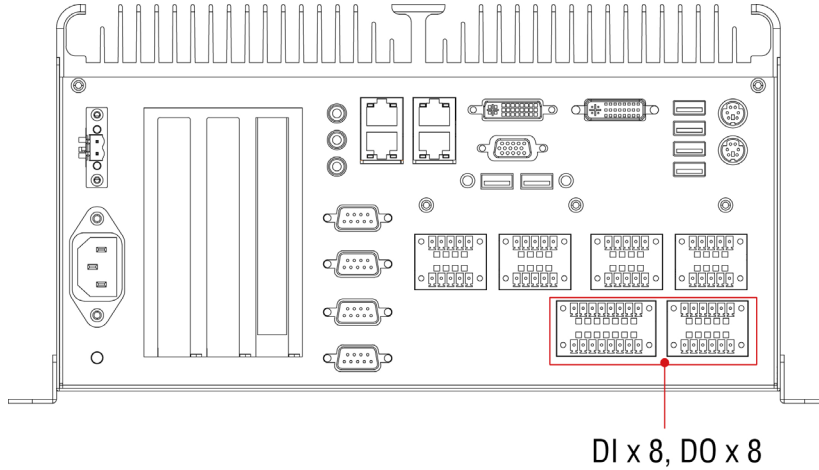
Connecting to the USB Device

The MC-7270-MP-T 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.

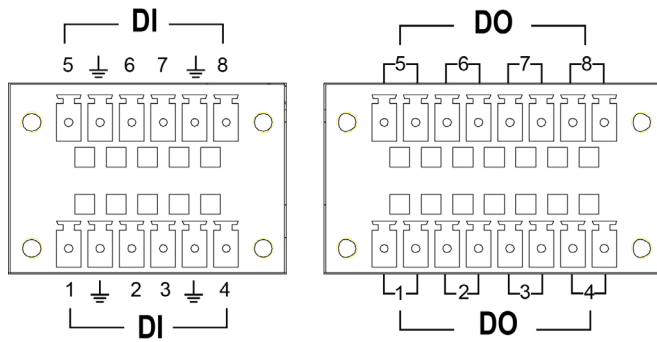


Connecting to Digital Input and Output Channels

The MC-7270-MP-T 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 that have been included in the package.



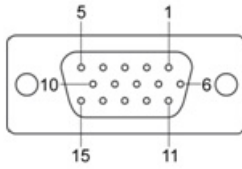
See the following figure for the pin assignments.



Connecting to a VGA Monitor

The MC-7270-MP-T 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-7270-MP-T. The pin assignments of the VGA connector are shown below.

DB15 Female Connector

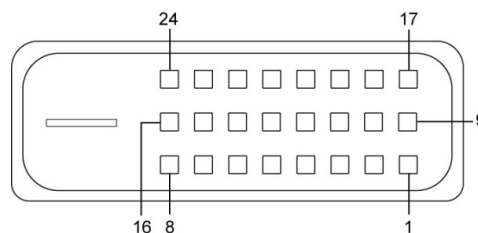


Pin No.	Signal Definition
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC Data
13	HSYNC
14	VSYNC
15	DDC Clock

Connecting to a DVI-D Monitor

The MC-7270-MP-T 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



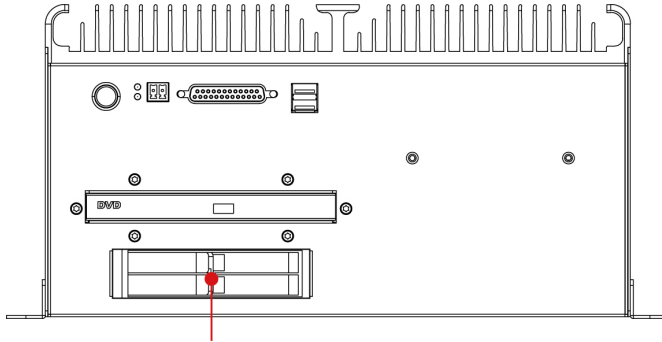
Pin No.	Signal Definition
1	T.M.D.S. Data2-
2	T.M.D.S. Data2+
3	T.M.D.S. Data2/4 Shield
4	N/C
5	N/C
6	DDC Clock
7	DDC Data
8	Analog Vertical Sync
9	T.M.D.S. Data1-
10	T.M.D.S. Data1+
11	T.M.D.S. Data1/3 Shield
12	N/C

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-

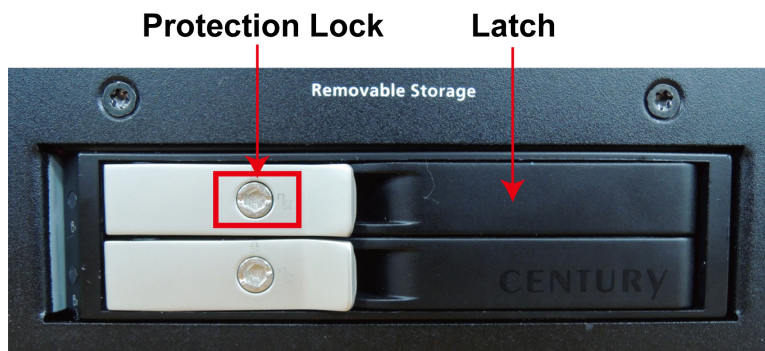
Installing the Removable SATA Storage Drive

The MC-7270-MP-T computer comes with a removable SATA storage device tray that is accessible through the front panel. Either a SATA hard disk or solid state drive may be installed, but only use of an SSD will ensure full anti-vibration compliance. To install a SATA storage device, please follow these instructions:

1. Disconnect the MC-7270-MP-T from the power source.
2. To remove the storage device tray, insert the protection key and turn it to the right, then unfasten the two thumbscrews that secure the removable tray. The storage tray's location may be seen in the following figure:



Removable Storage Trays



3. Pull out the protection lock and then directly insert the storage device, such as HDD or SSD, into the slot.

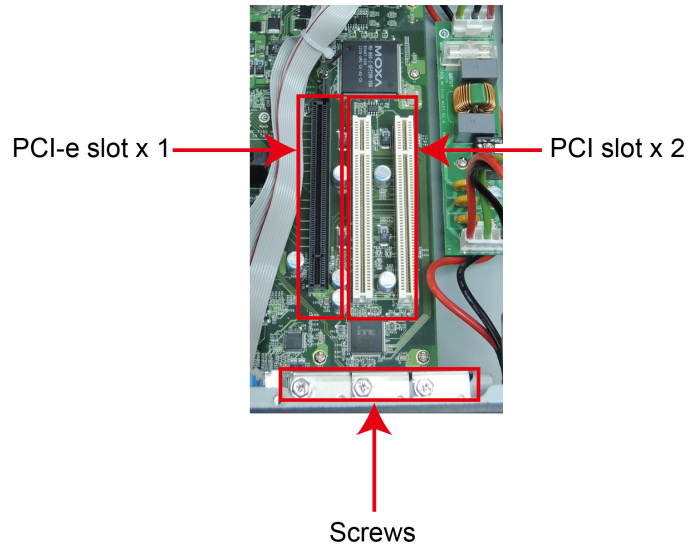


4. When finished, close the latch, and complete the installation by turning the key leftwards to lock the tray into place.

Installing PCI and PCIe Cards

The MC-7270-MP-T 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.



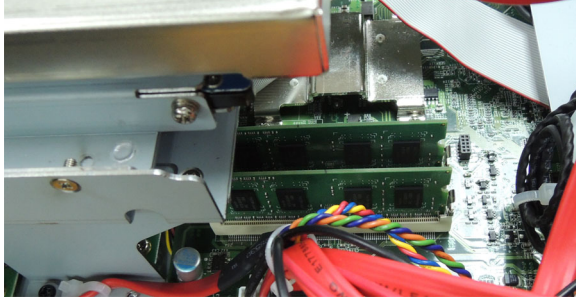
5. When finished, replace the top cover of the computer and complete the installation.

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

Upgrading the Memory Module

The MC-7270-MP-T comes with 4 GB of pre-installed DDR3 SDRAM, which can be extended to 16 GB by adding 8 GB in each of the two slots. 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.

BIOS Setup

This chapter describes the BIOS settings of the MC-7270-MP-T 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**

- Set Supervisor Password

❑ **Power Settings**

- Auto Boot Up
- Auto Wake on S5
- Wake on LAN

❑ **Boot Settings**

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

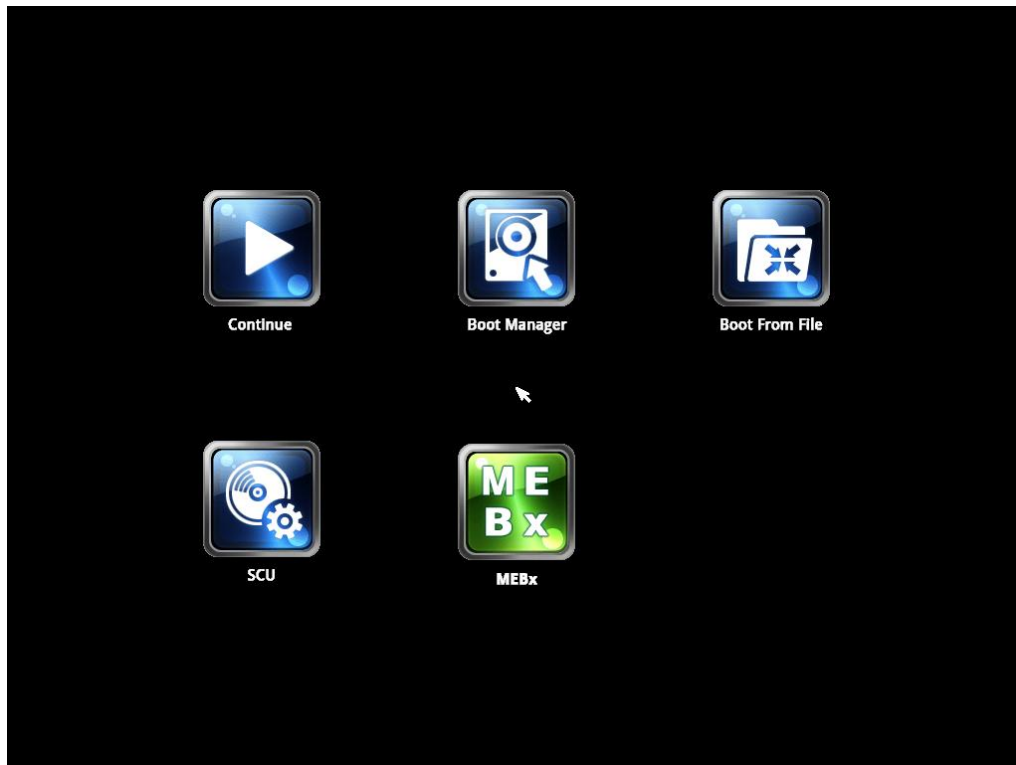
❑ **Exit Settings**

- 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

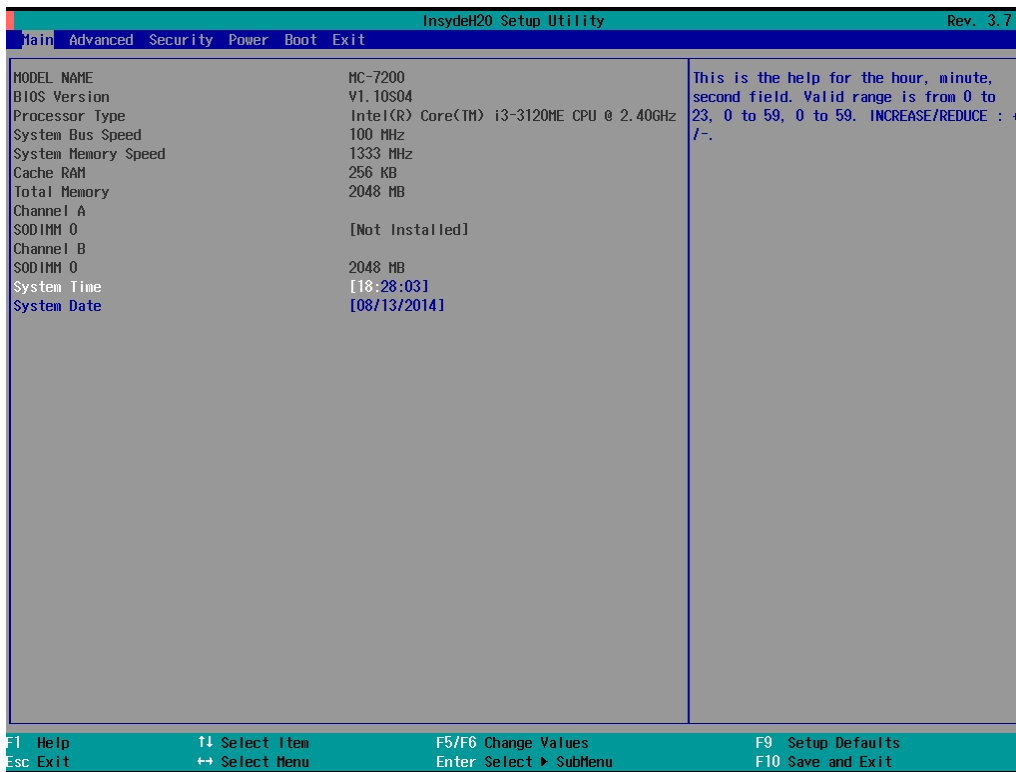
F10: Save and Exit

↑ ↓: Select Item

← →: Select Menu

ESC: Exit

ENTER: Select or go to Submenu

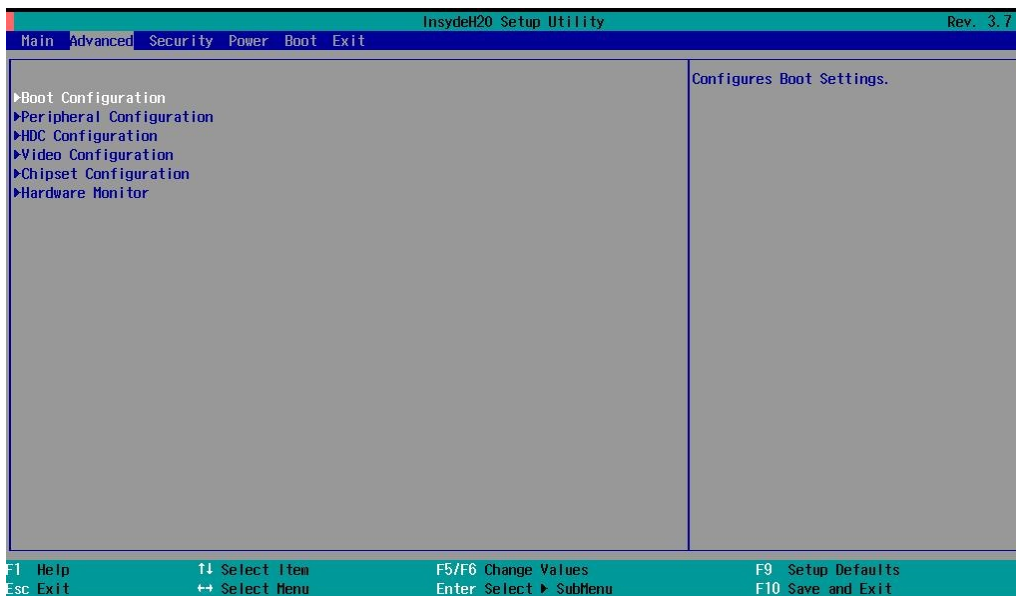


Main Information

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

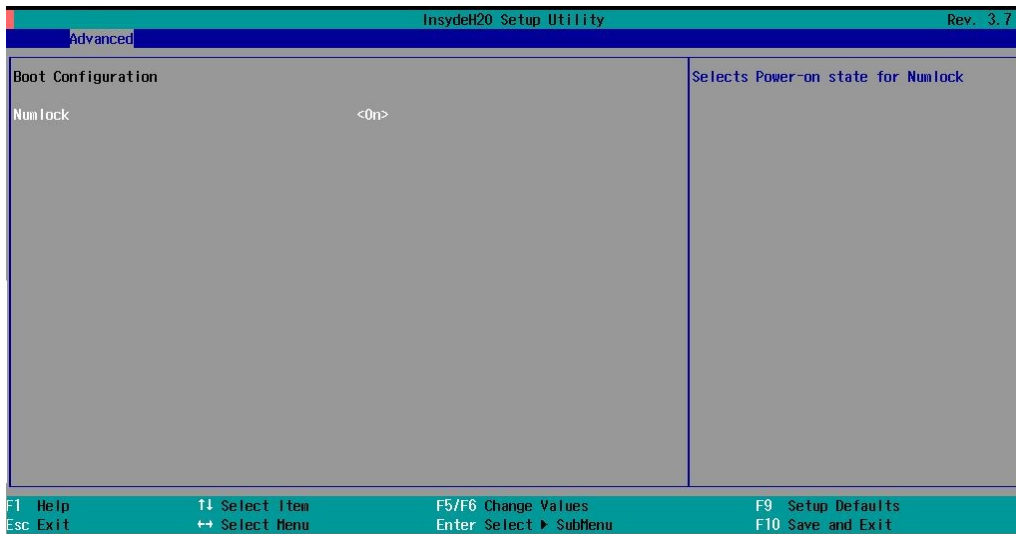
Advanced Settings

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

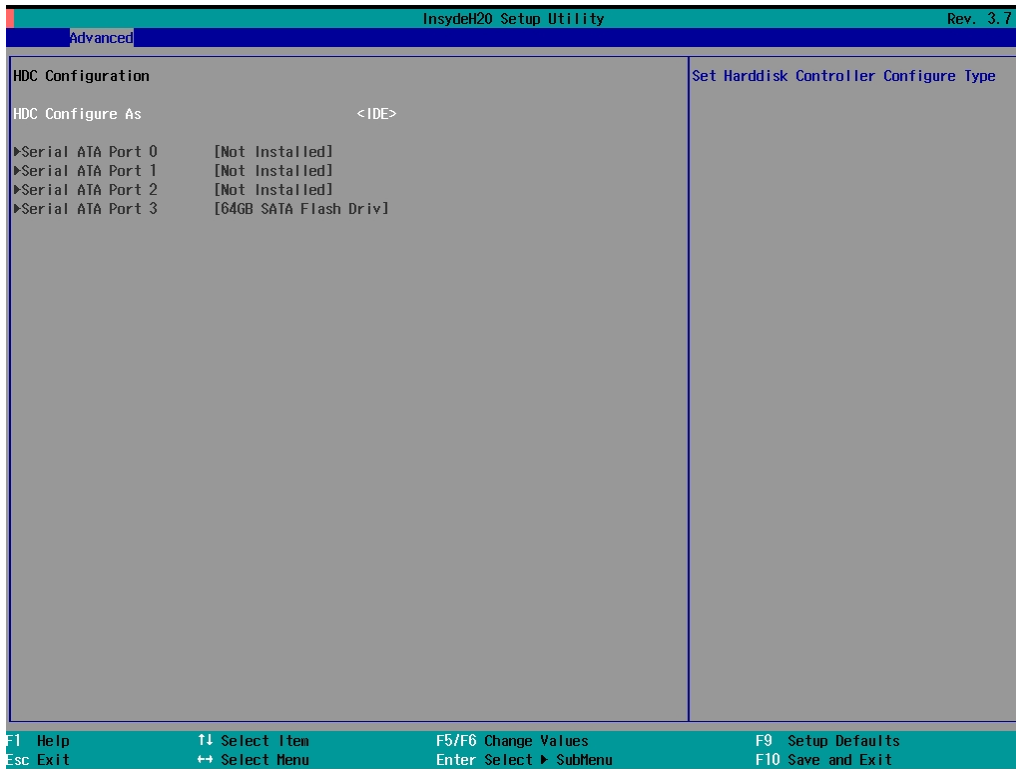
Mode

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

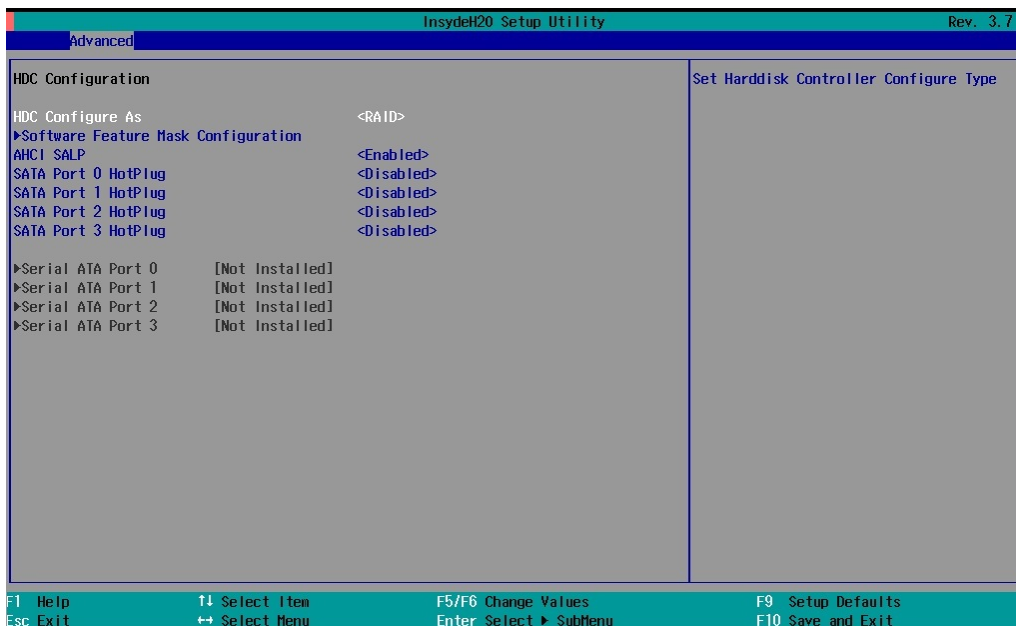
Options: SPP (default), EPP, ECP, EPP+ECP

HDC Configuration

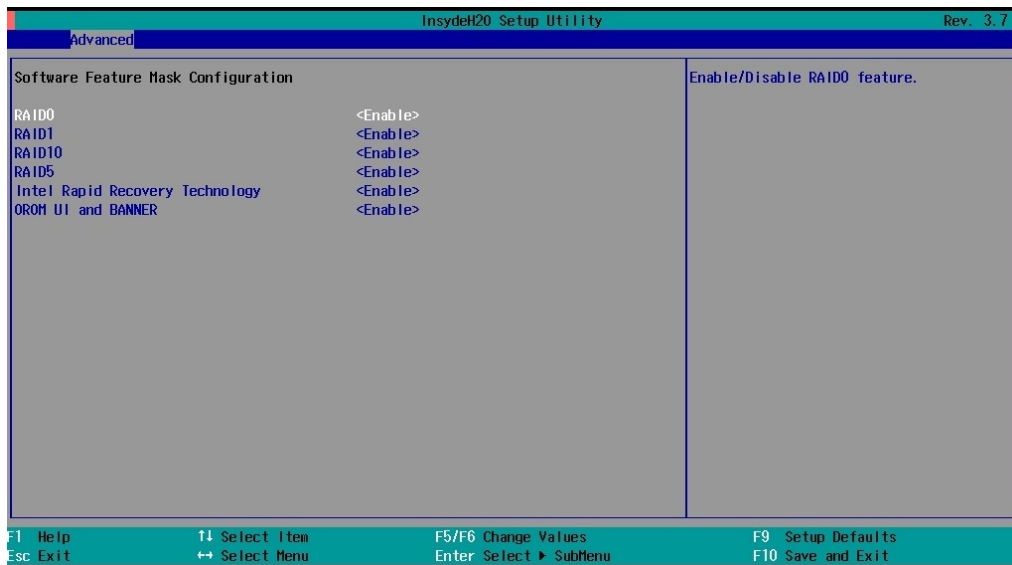
The host drive controller may be configured for IDE (legacy default), AHCI, or RAID mode. When the legacy IDE mode is selected, the following screen will appear.



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

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

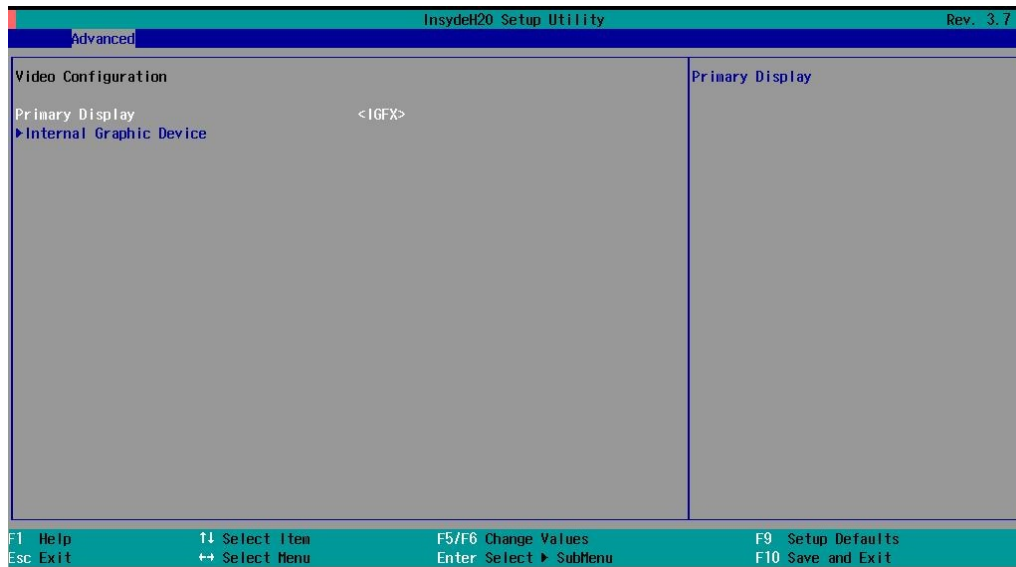
Video Configuration

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

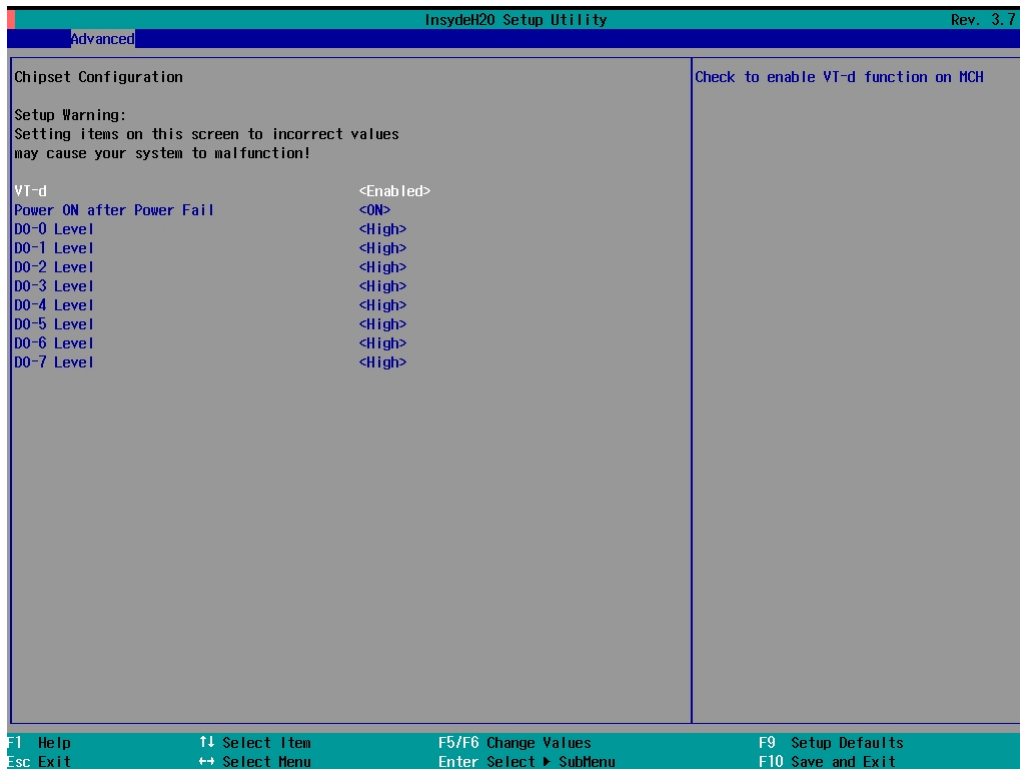
IGD – Boot Type

This item allows you to select the video device that 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

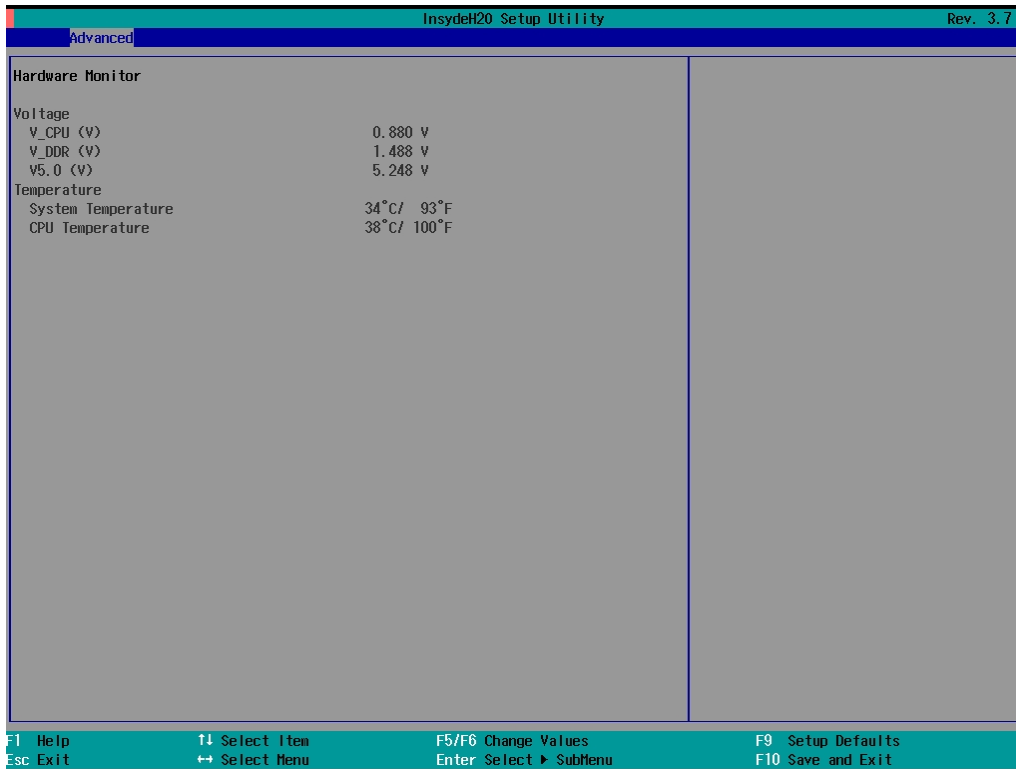
Power ON after Power Fail

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

Options: ON (default), OFF, Last State

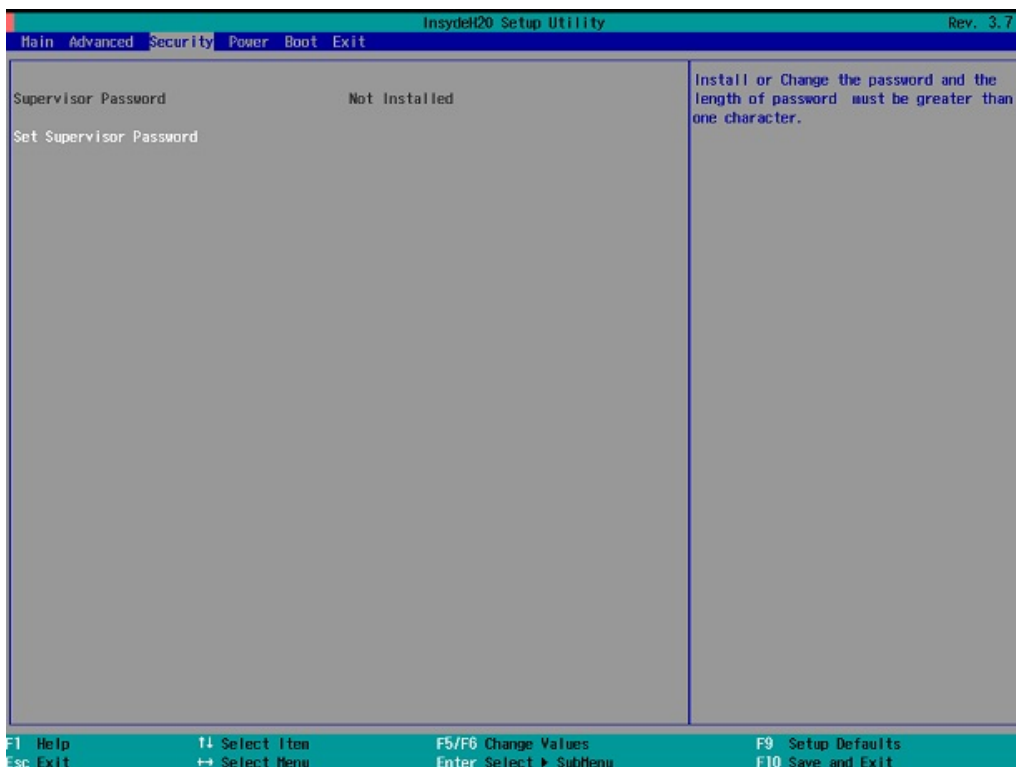
Hardware Monitor

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.



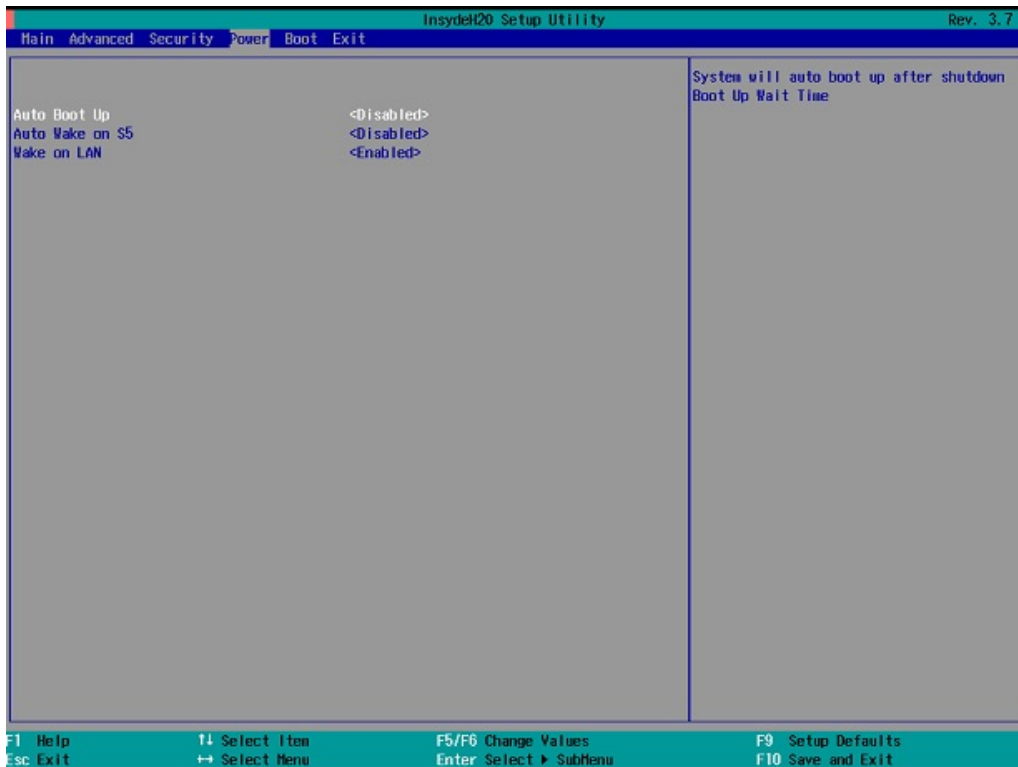
Set Supervisor Password

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.



Auto Boot Up

Enabling this function will cause the system to boot up automatically after the system has entered S5 for 1 minute.

Auto Wake on S5

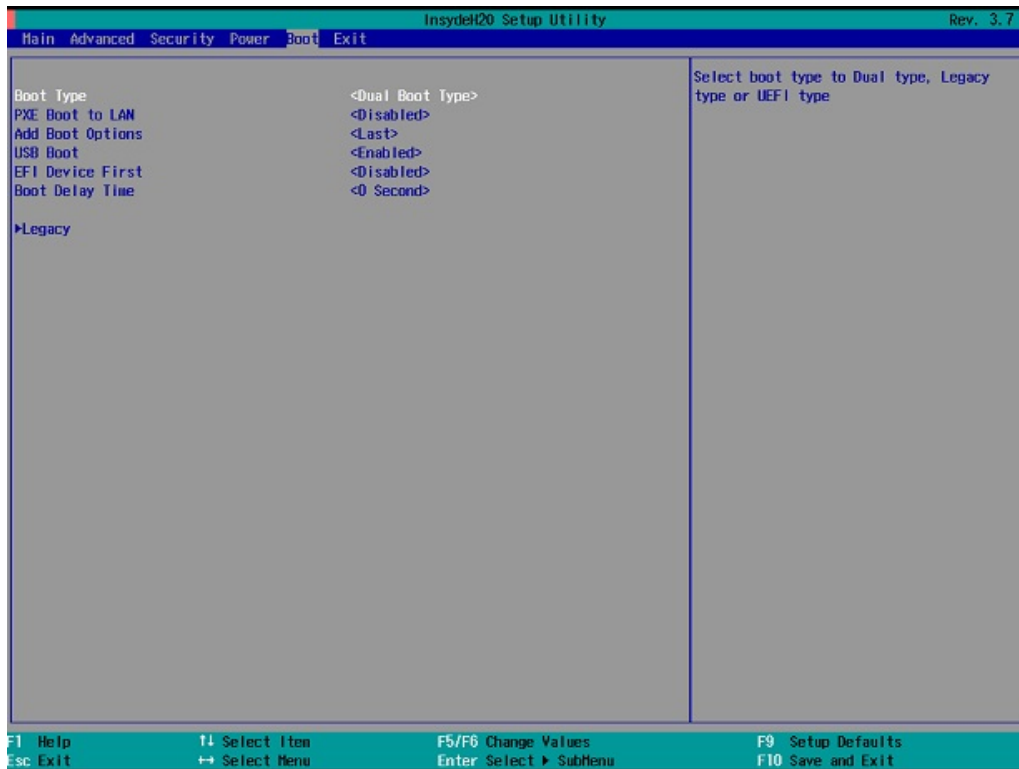
Sets the RTC time to wake up the system.

Wake on LAN

Enables remote wake up by LAN magic-packet.

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.

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.

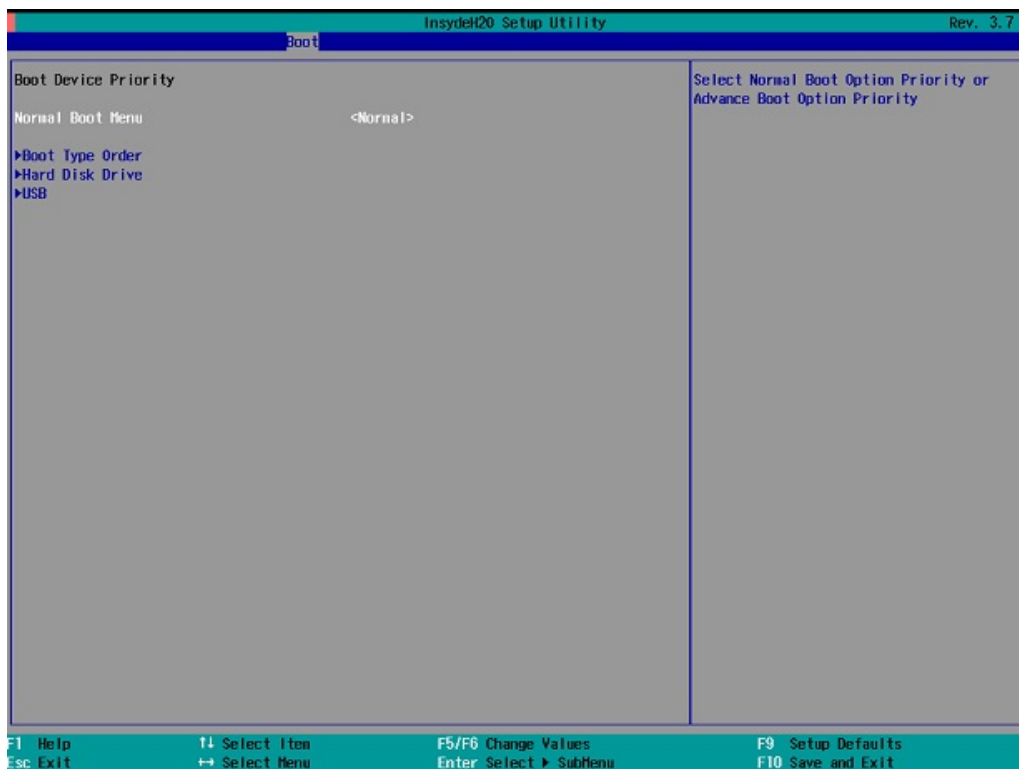
Options: Disabled (default), Enabled

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

Boot Device Priority



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.

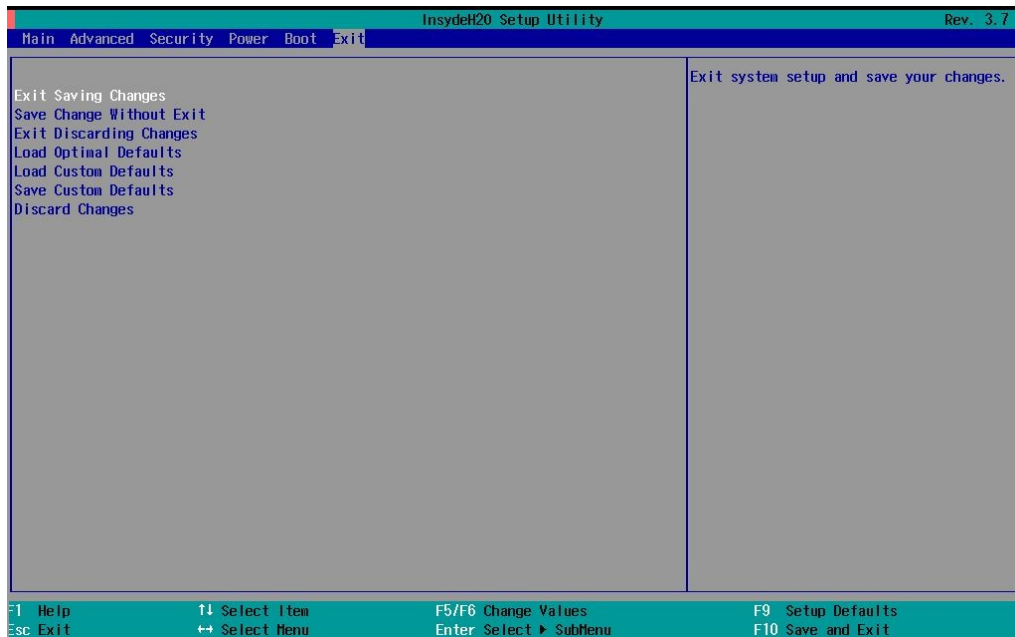
Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, Others

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

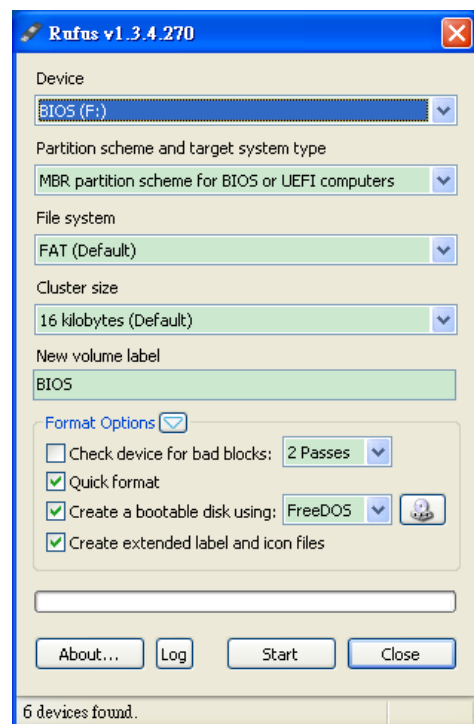
Upgrading the BIOS

This section describes how to upgrade the BIOS. However, please note that it is easy to permanently damage the computer when upgrading the BIOS. We strongly recommend that you contact Moxa’s technical support staff for assistance in order to obtain all necessary tools and the most current advice before attempting to upgrade the BIOS on any Moxa device.

Step 1: Create a Bootable USB Disk

Before upgrading the BIOS every user should first create a bootable USB RAM drive as a system rescue device. A useful software suite for building USB RAM drives can be found by searching for Rufus, which can then be downloaded and used to create a bootable RAM drive. Take the following steps to create a bootable USB disk by using Rufus.

1. Start Rufus and select the USB device that you want to use as a bootable disk from the Device drop-down list.
2. Select **MBR partition scheme for BIOS or UEFI computers** to boot from a legacy BIOS or UEFI.
3. Select **FAT (Default)** from File system drop-down list.
4. Select **16 kilobytes (Default)** for Cluster size.
5. Enter a drive name under **New volume label**.
6. Check **Quick format**, **Create a bootable disk using FreeDOS**, and **Create extended label and icon files**.
7. Click **Start** to format and create the bootable USB drive.



ATTENTION

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

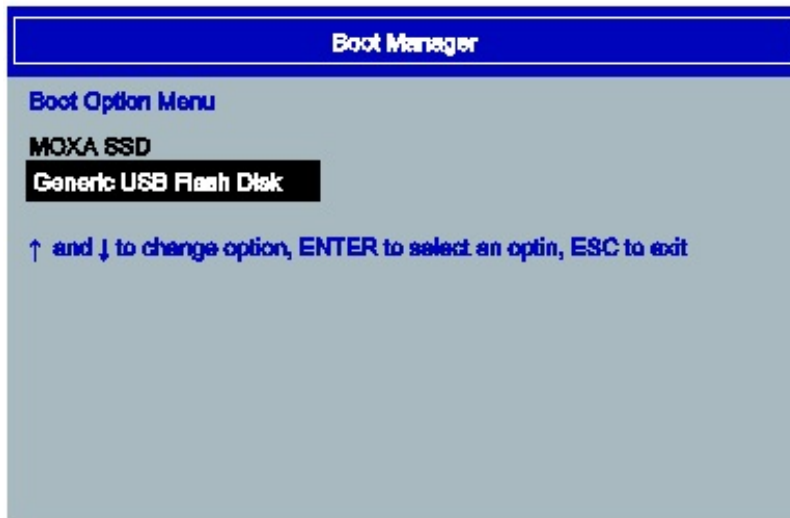
Step 2: Prepare the Upgrade File

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: **MC72xxSxx.exe** (xx refers to version numbers).
2. Copy the file to the Bootable USB Disk.

Step 3: Run the upgrade program on the MC-7270-MP-T 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, and then press Enter to continue.



3. When the computer finishes booting up, a DOS screen will appear. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the MC_7270 folder, type `cd MC_7270`.

```
C:\>cd MC_7270
```

4. Run the upgrade program by typing `MC7270S03.exe`. The upgrade filename may vary depending on the version.

```
C:\ MC_7270>MC7270S01.exe
```

5. The upgrade program will execute automatically. Please wait patiently for the procedure to finish.

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

Please do not remove the AC power!

Insyde Flash Utility for InsydeH2O
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

6. When the upgrade is complete, the computer will automatically reboot. You may check the BIOS version on the Main page of the BIOS Setup. The following figure shows an example. (Note: The actual BIOS version depends on which version you used.)

MODEL NAME	MC-7200
BIOS Version	V1.10S04
Processor Type	Intel(R) Core(TM) i7 CPU 3555LE @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



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

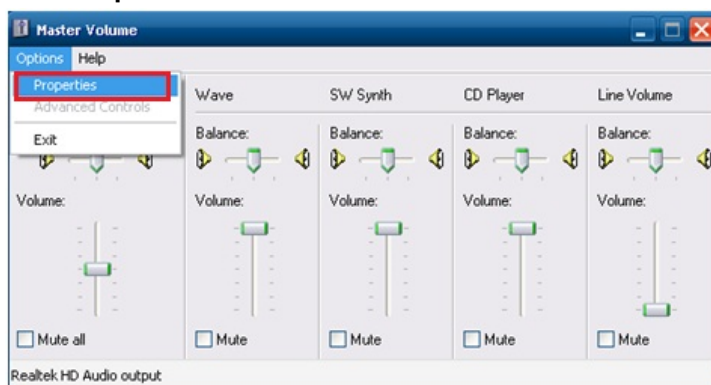
This chapter describes how to adjust the of the MC-7270-MP-T's audio settings for the **Mixer** function in the Windows XP and Windows XP Embedded operating systems.

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:

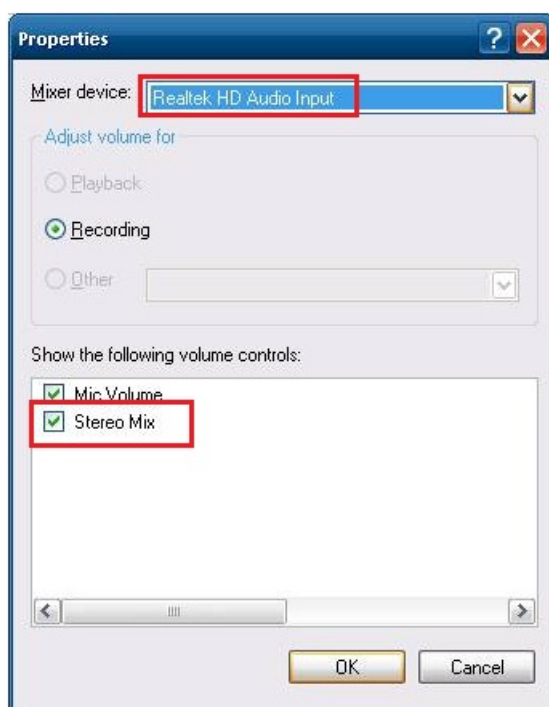
1. Right-click the volume icon and select **Open Volume Control**.



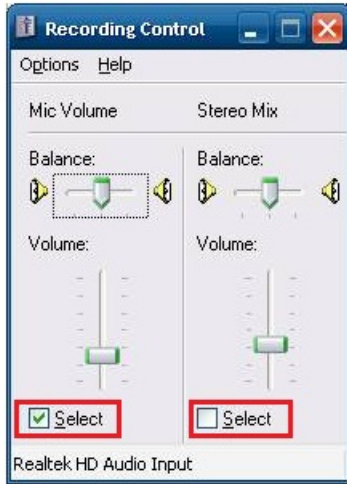
2. Select **Properties**.



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.

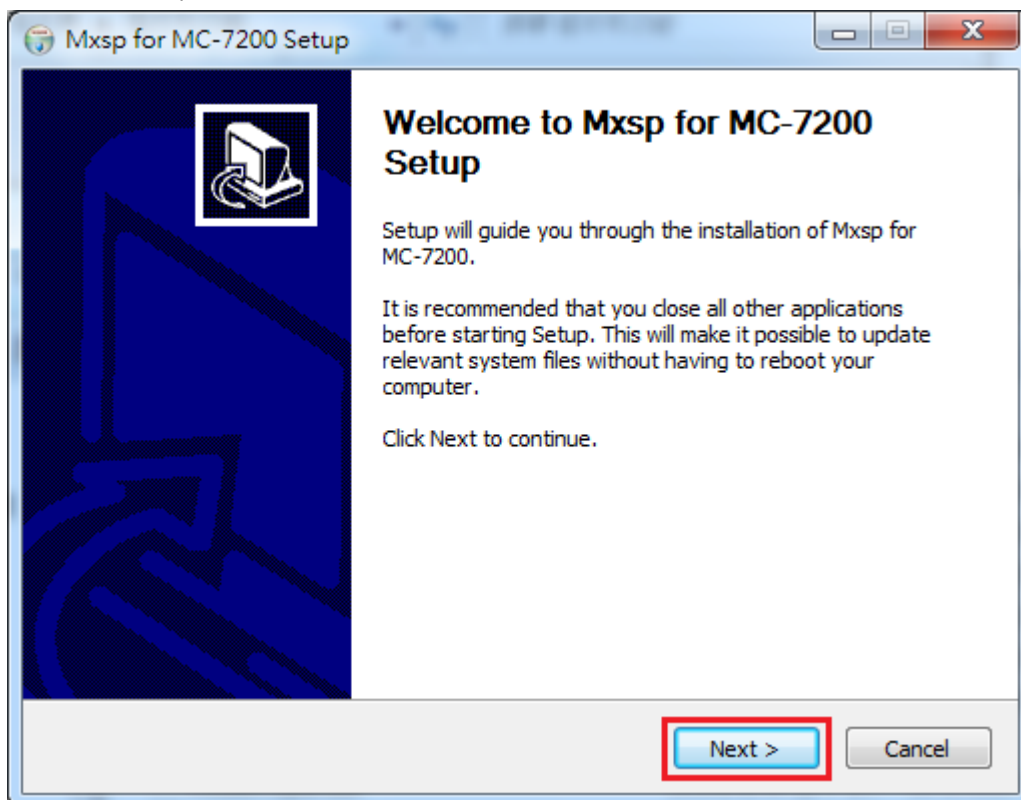


Configuring Serial Ports

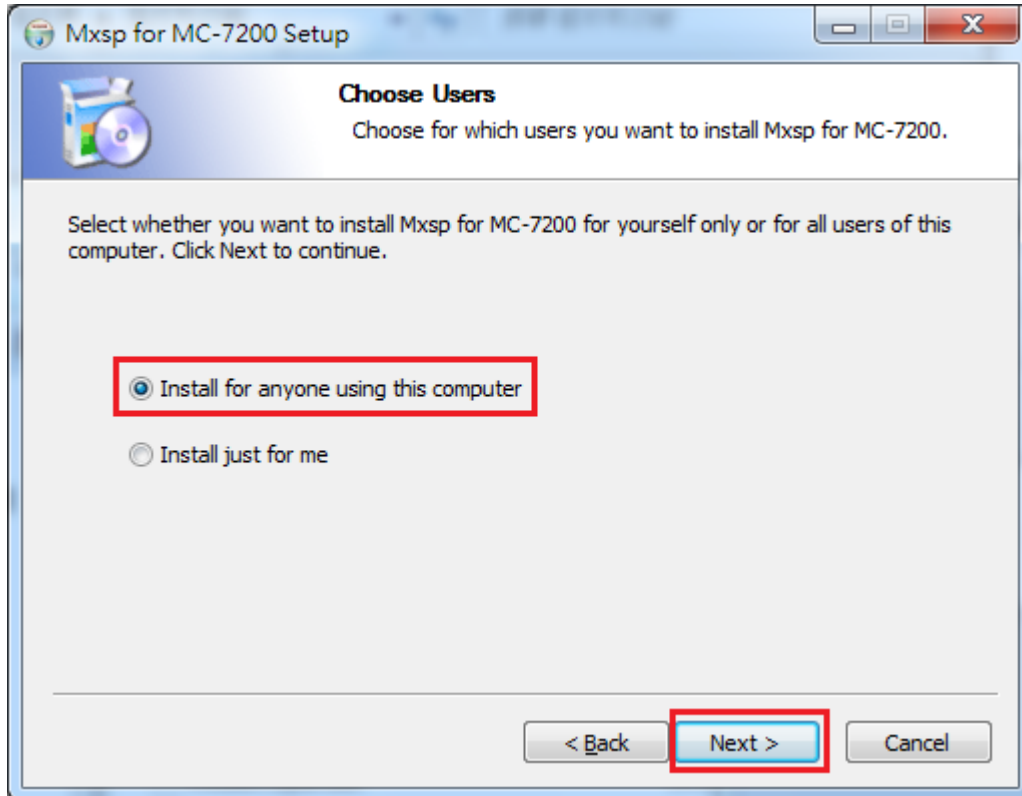
This chapter shows how to configure the 3-mode serial ports, COM3 and COM4, using the application in product CD. The path to the application is <Software DVD>\MC-7270-MP-T\utility\mxsif

How to Install the Application

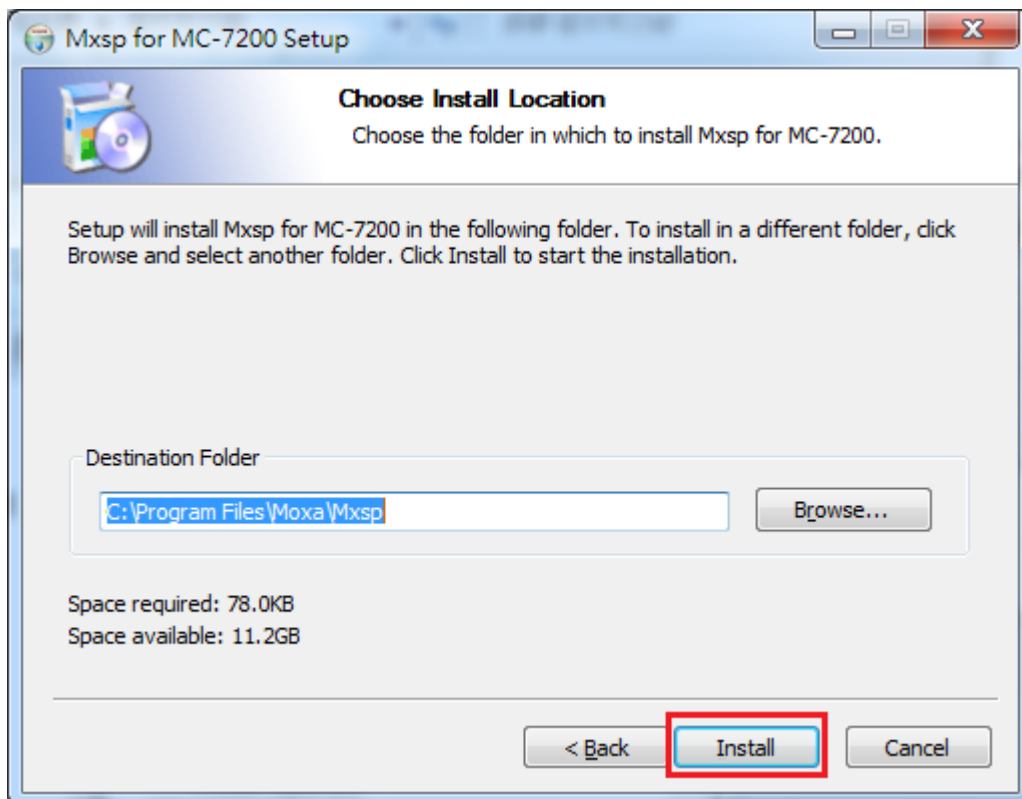
1. Double click the utility **Mxsp_MC-7200_1.0_x64_Setup**. When the following setup message appears, click **Next >** to proceed.



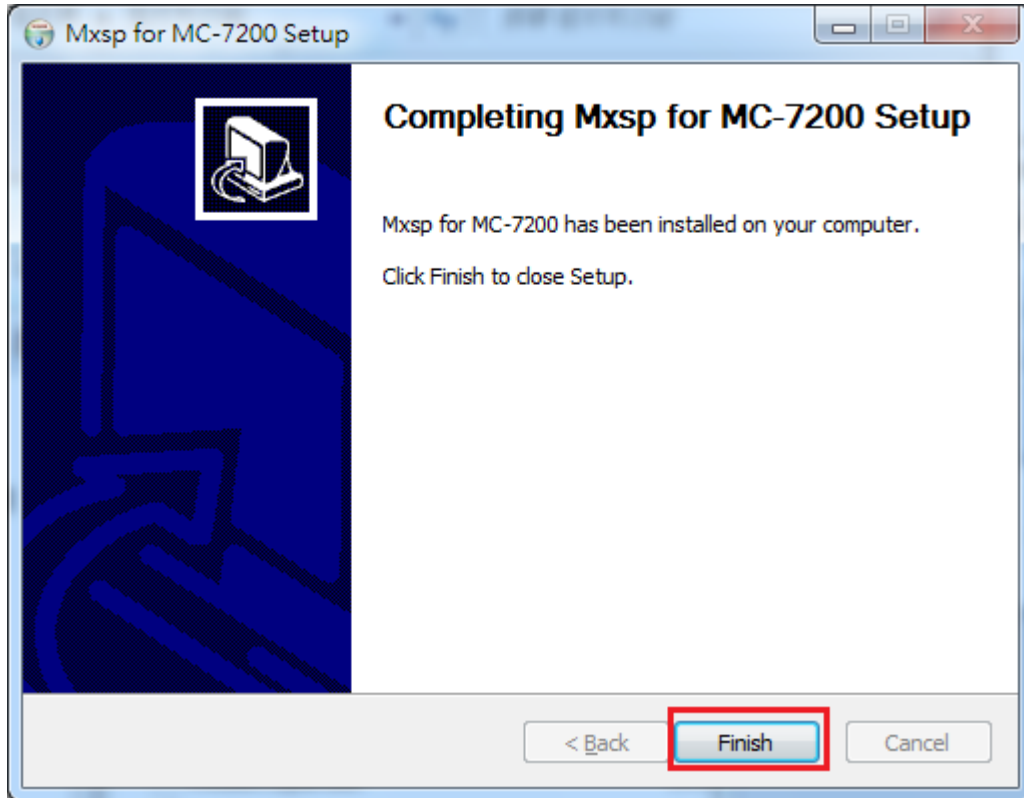
2. Select **Install for anyone using this computer** or **Install just for me** and then click **Next >** to proceed.



3. Specify which folder on this computer you would like the application to be installed in, and then click **Install**.



4. Click **Finish** to complete the installation process.

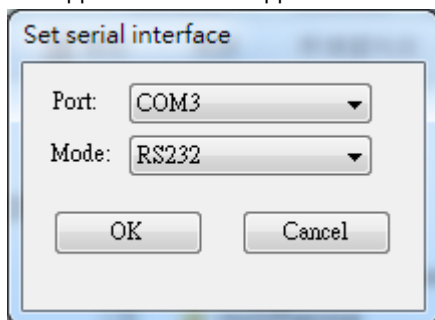


How to Use the “mxSerialInterface” Utility

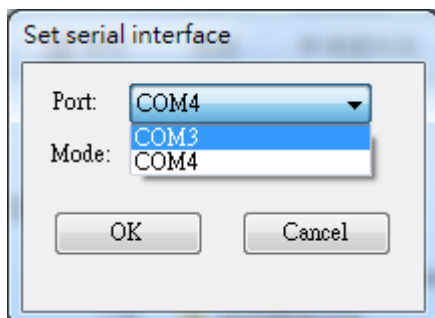
1. Double click the **mxSerialInterface** icon.



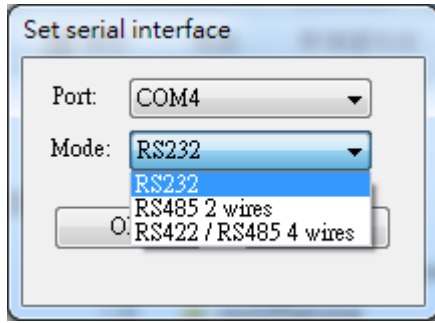
2. The application UI will appear as shown below.



3. Select COM3 or COM4 from the **Port** drop-down menu.



4. Select "RS232", "RS485 2 wires", or "RS422/RS485 4 wires" from the **Mode** drop-down menu.



5. For example, if you select "COM4" and "RS232" and then click **OK**, you can use COM4 as an RS-232 serial port.

