MC-7270-DC-CP-T User's Manual

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www.moxa.com/product

MC-7270-DC-CP-T User's Manual

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Introduction

In this chapter, we present specifications, discuss hardware installation, and how to configure the BIOS.

The following topics are covered in this chapter:

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

Overview

The MC-7270-DC-CP-T computer features the Intel® Core™ CPU processor and comes with 4 serial ports, 4 Gigabit Ethernet ports, and 6 USB hosts. The computer offers high performance and versatile peripherals for marine applications.

Designed with the highest quality and durability in mind, the marine-grade MC-7270-DC-CP-T computer features a rugged chassis that can withstand 1g vibrations, providing a reliable platform that can be used even in harshest of environments. In addition, the compact size, fanless design, and low power consumption deliver an optimal thermal solution that makes installation easy for bridge systems in marine applications. Users can easily install Windows XP Embedded, XP Professional, or Windows 7, to provide a flexible and friendly environment for system development and application implementation.

Package Checklist

Each model is shipped with the following items:

- 1 MC-7270-DC-CP-T computer
- 2-pin terminal block for DC power input
- 2-pin terminal block for Power ON/OFF switch
- Hard disk installation kit
- 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-7270-DC-CP-T embedded computer has the following features:

- High performance Intel® Core™ i7 3555LE processor
- Compact size and fanless design
- Three independent displays (DVI-D x 2 + VGA x1)
- 4 Gigabit Ethernet ports for network redundancy
- SATA drive storage capability
- -40 to 70°C operating temperature range

Hardware Specifications

Computer

CPU: Intel® Core™ i7-3555LE, dual core 64-bit 2.5 GHz processor

Supported 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 (one for internal storage and one for the removable storage tray)

USB: USB 2.0 hosts x 6, Type A connectors

Other Peripherals

Audio: Line in x 1, Line out x 1

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

LPT Ports: 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 male)

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/XOF

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

LEDs

System: Storage, Power

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

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 3.85 kg

Dimensions: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 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: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)

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

Standards and Certifications

Safety: UL/cUL, CCC

EMC: EN 55032 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A

Marine Standard: IEC-60945 4th, IEC-61162

Marine Type Approval: DNV 2.4 and ABS (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

MTBF (mean time between failures): 220,490 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Hardware Block Diagram

2
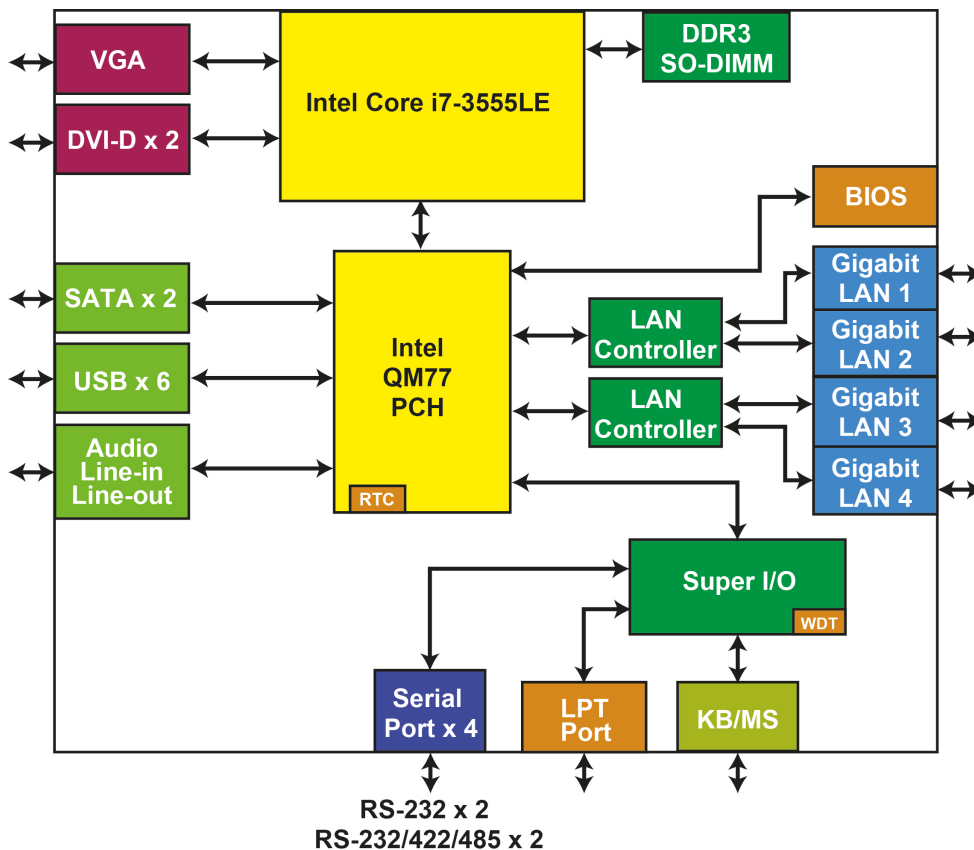
Hardware Introduction

The MC-7270-DC-CP-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 for wireless operation, 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**
  ➢ MC-7270-DC-CP-T Front View
  ➢ MC-7270-DC-CP-T Rear View
❑ **Dimensions**
❑ **LED Indicators**
❑ **Real Time Clock**

Appearance

MC-7270-DC-CP-T Front View

MC-7270-DC-CP-T Rear View

Dimensions

Unit = mm (inch)

274 (10.79)

287 (11.30)

250 (9.84)

2.5 (0.10)

70 (2.76)

302 (11.89)
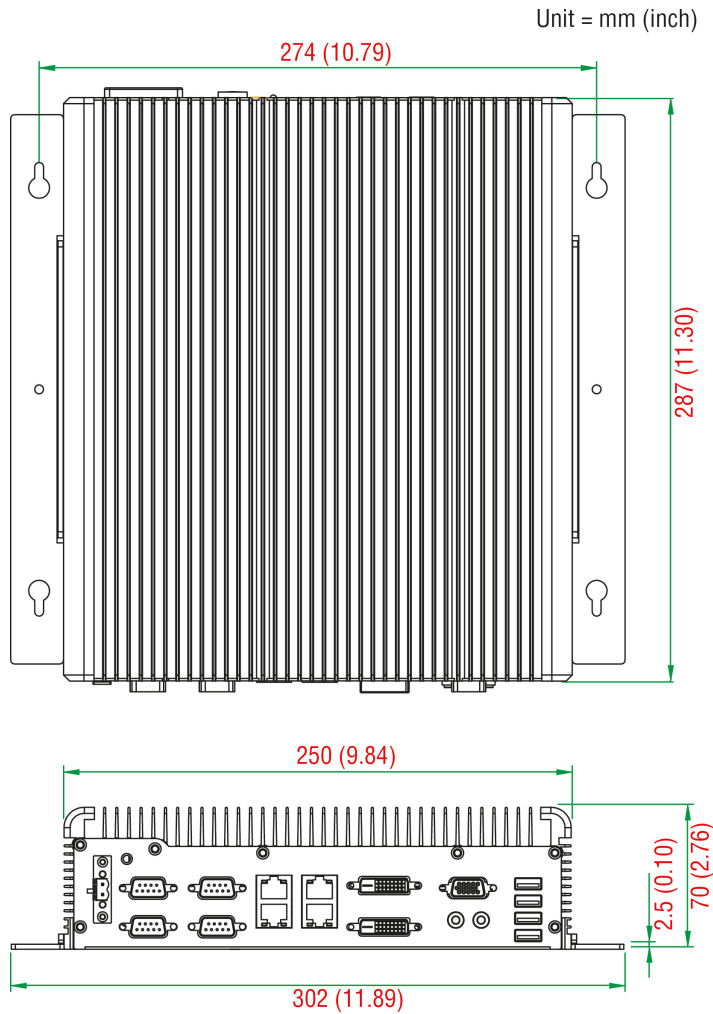
LED Indicators

LED Name	LED Color	LED Function
Power (on the front panel)	Green	Power is on and functioning normally
	Off	Power is off or a power error exists
Storage (on the front panel)	Red (on)	HDD/SSD is inserted and detected
	Red (blinking)	HDD/SSD is reading/writing
	Off	No activity
LAN (on each LAN port)	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 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

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 need to replace your battery.

Caution

There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions on the battery.

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Hardware Connection Description

This chapter shows you how to connect the MC-7270-DC-CP-T to the network and to various devices.

The following topics are covered in this chapter:

❒ **Installing the MC-7270-DC-CP-T**

❒ **Wiring Requirements**

❒ **Connecting the Power**

❒ **Grounding the MC-7270-DC-CP-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 a VGA Monitor**

❒ **Connecting to a DVI-D Monitor**

❒ **Connecting to a Speaker or a Headphone**

❒ **Installing the Removable SATA Storage Drive**

❒ **Installing the Internal SATA Storage Drive**

❒ **Upgrading the Memory Module**

Installing the MC-7270-DC-CP-T

<u>**Wall or Cabinet Mounting**</u>

The MC-7270-DC-CP-T comes with two brackets pre-installed on both ends of the computer. Use two screws per side to attach the MC-7270-DC-CP-T to a wall or cabinet. We recommend that you use size M4 or larger screws.

Screws   Screws
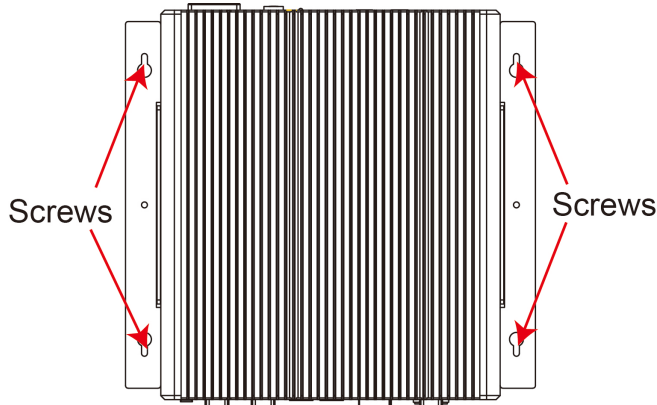
Wiring Requirements

This section describes how to connect serial devices to the MC-7270-DC-CP-T.

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 to all devices in the system.

⚠️ **ATTENTION**

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your MC-7270-DC-CP-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-DC-CP-T model has a 24 VDC power input (with tolerance from 18 to 30 VDC) through 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

Grounding the MC-7270-DC-CP-T

Grounding and 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 to a well-grounded mounting surface, such as a metal panel.

Earth Ground Wire: The figure shows the location of the earth ground on the terminal block power connector. Connect the ground wire to an appropriately grounded metal surface.

Earth Ground Connector
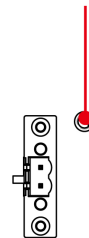
Connecting Data Transmission Cables

This section describes how to connect the MC-7270-DC-CP-T computer to the network and serial devices.

Connecting to the Network

Plug your network cable into the embedded computer's Ethernet port. The other end of the cable should be plugged into your Ethernet network. 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 port uses 8-pin RJ45 connectors. The following diagram shows the pinouts for these ports.

The LED indicators on the right top and right bottom 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.
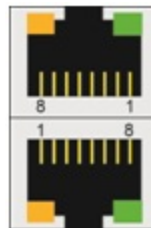
Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	ERx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

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. You can use the application on the product CD to configure both COM1 and COM2. For detailed instructions, refer to Appendix C. The pin assignments are shown in the following table:

DB9 Male Port
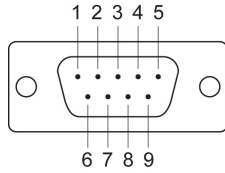
RS-232/422/485 Pinouts

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	–	–	–

Connecting a PS/2 Keyboard and Mouse

Your MC-7270-DC-CP-T computer comes with 2 PS/2 mini-DIN connectors on the front 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
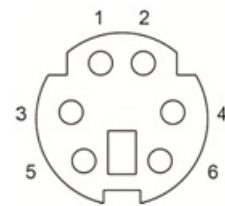
Pin No.	Signal Definition
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	GND
4	VCC
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock

Connecting to the USB Device

The MC-7270-DC-CP-T comes with 2 USB 2.0 hosts on the front panel, and 4 USB 2.0 hosts on the rear panel. The hosts can be used for an external flash disk or hard drive for storing large amounts of data. You can also use these USB hosts to connect to a keyboard or a mouse.

Connecting to a VGA Monitor

The MC-7270-DC-CP-T comes with a D-Sub 15-pin female connector on the front panel to connect a VGA monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the MC-7270-DC-CP-T. The pin assignments of the VGA connector are shown below.

DB15 Female Connector
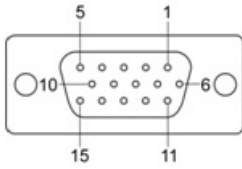
Pin No.	Signal Definition
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC Data
13	HSYNC
14	VSYNC
15	DDC Clock

Connecting to a DVI-D Monitor

The MC-7270-DC-CP-T computers come with two DVI-D connectors that can connect to two DVI monitors. Use the cable to connect one end to the DVI-D connector and the other end to the monitor. See the following table for DVI-D connector pin assignments.

DVI-D Connector
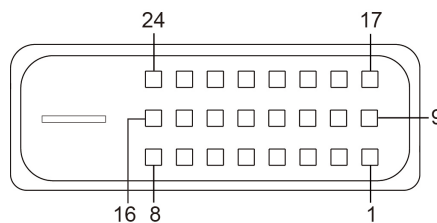
Pin No.	Signal Definition		Pin No.	Signal Definition
1	T.M.D.S. Data2-		13	N/C
2	T.M.D.S. Data2+		14	+5V Power
3	T.M.D.S. Data2/4 Shield		15	Ground (return for +5V, HSync, and VSync)
4	N/C		16	Hot Plug Detect
5	N/C		17	T.M.D.S. Data0-
6	DDC Clock		18	T.M.D.S. Data0+
7	DDC Data		19	T.M.D.S. Data0/5 Shield
8	Analog Vertical Sync		20	N/C
9	T.M.D.S. Data1-		21	N/C
10	T.M.D.S. Data1+		22	T.M.D.S. Clock Shield
11	T.M.D.S. Data1/3 Shield		23	T.M.D.S. Clock+
12	N/C		24	T.M.D.S. Clock-

Connecting to a Speaker or a Headphone

The MC-7270-DC-CP-T comes with line-in and line-out interfaces on the rear panel for connecting a microphone and speaker or headphones.

Installing the Removable SATA Storage Drive

The MC-7270-DC-CP-T includes a removable storage device tray on the front panel. You need to install your own storage drive. Either a SATA hard disk or solid state drive may be installed, but only an SSD will ensure full anti-vibration compliance.

To install a SATA storage device, complete the following steps:

1. Disconnect the MC-7270-DC-CP-T from the power source.
2. To remove the storage device tray, insert a hex-type screwdriver in the appropriate slot, rotate it to the left, and then move the lock towards the left so that the spring-loaded latch can be used to pull out the tray.

Spring-loaded Latch
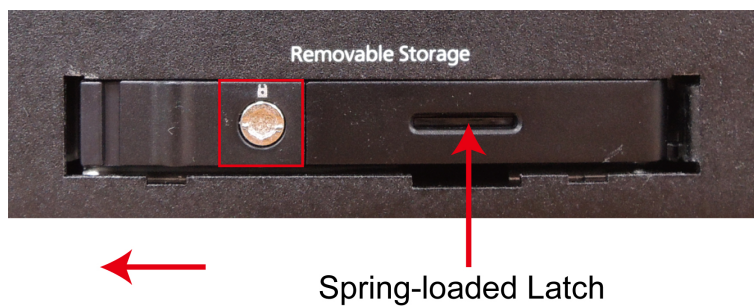
3. Remove the storage device tray from the slot and turn it over.
4. Place a disk drive into the storage device tray and install the four screws (in the hard drive installation kit) to secure the drive in the tray.

5. Insert the storage device tray into the slot and secure it in place by pushing in the spring-loaded latch.
6. Use the protection key to lock the storage device tray into place.

Installing the Internal SATA Storage Drive

You can install a SATA storage drive in the internal SATA slot in the MC-7270-DC-CP-T. This allows you to expand the storage capacity of the MC-7270-DC-CP-T.

Before you continue, make sure that you have the storage drive expansion kit that is included your MC-7270-DC-CP-T package.

1. Turn off the MC-7270-DC-CP-T and disconnect it from the power source.
2. Turn over the MC-7270-DC-CP-T to access the slot cover.
3. Remove the four screws that secure the slot cover to the computer; then, remove the slot cover.
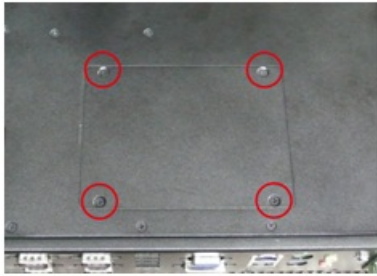
4. Open the storage drive expansion kit that comes with your MC-7270-DC-CP-T package and make sure that you have the following items:
   - A plastic shell
   - Five strips of foam cushions
   - Four screws
   - Two metal plates.
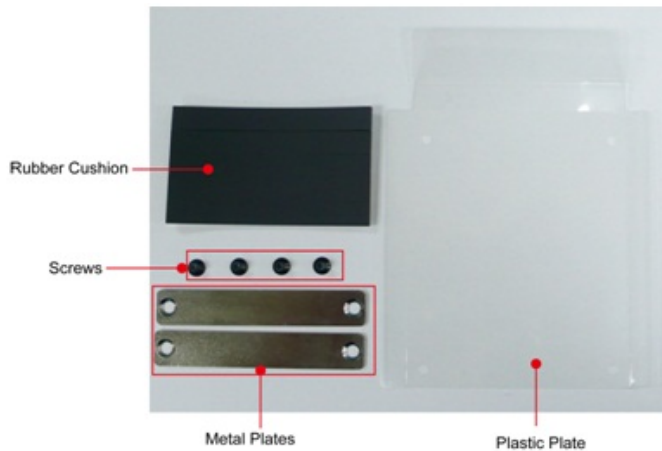
5. Fold the two long sides of the plastic plate upward.
6. Attach a foam cushion to each of the long folded sides on the plastic plate.
7. Attach the third foam cushion to the side of the extended flap on the plastic plate.
   The following figure shows the completed plastic plate assembly.
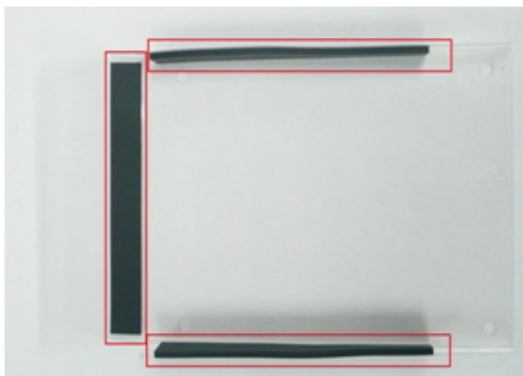
8. Turn the storage drive so that the SATA connector is facing you.
9. Place the plastic plate over the storage drive. Make sure that the switch hole cutouts on the plastic plate align with the screw holes on the storage drive.
10. Install the four screws to secure the metal plates on the storage drive.
11. Attach the two remaining foam cushions next to the metal plates on the storage drive.
    The following figure shows the completed storage drive assembly.
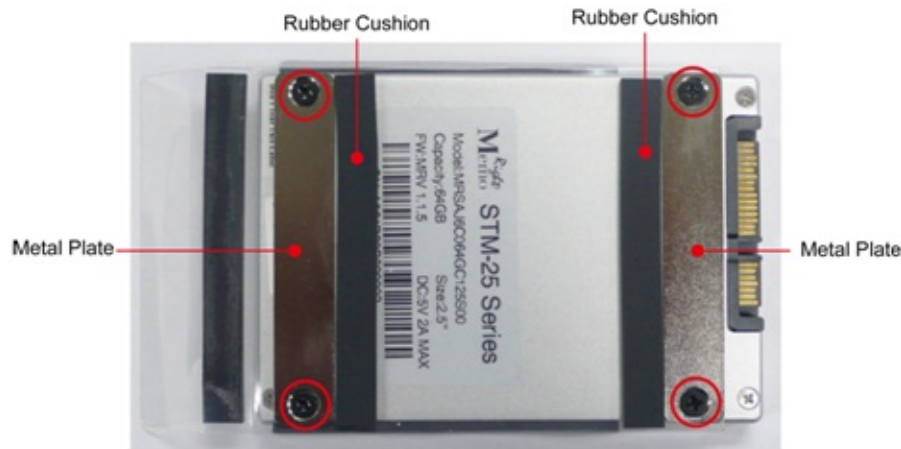
12. Connect the SATA cable and push the storage drive completely into the expansion slot.
    The attached foam cushions help the storage drive to fit snuggly in the expansion slot.

NOTE   If the storage drive does not fit snuggly in the expansion slot, you can add extra padding using non-volatile materials (for example, rubber pad or sponge).

13. Reinstall the slot cover over the expansion slot on the computer.

Upgrading the Memory Module

The MC-7270-DC-CP-T comes with 4 GB DDR3 SDRAMs pre-installed, and supports up to a maximum of 16 GB DDR3/DDR3L SDRAM.

To upgrade the memory module, complete the following steps:

1. Remove the removable storage tray on the front panel.
2. Remove all the screws on the back cover of the computer.
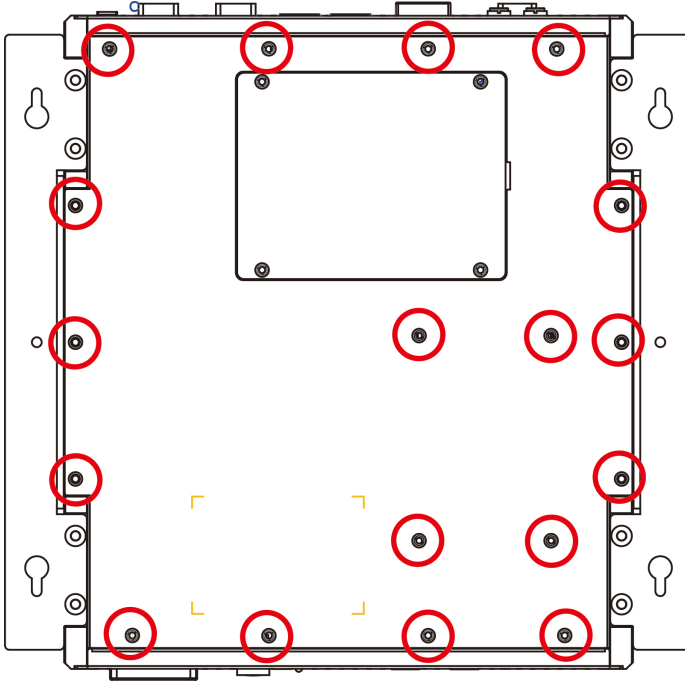
3. Remove the bottom cover. Then, remove the four screws from the storage tray cover.

4. When finished, remove the storage tray cover to expose the memory module.
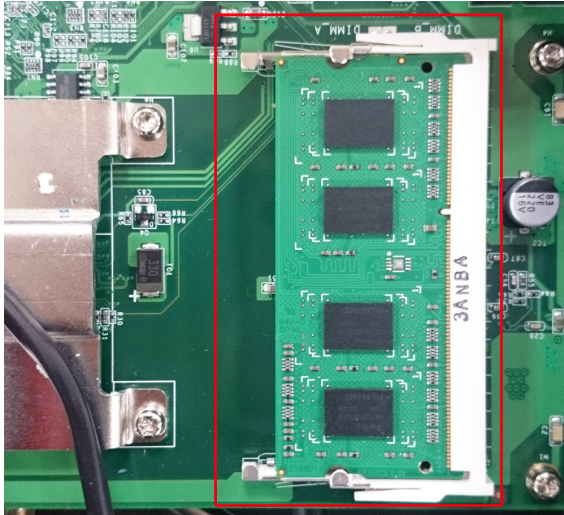
5. There are two latches, one on either side of the memory module. Push the latches outward to release the memory module. The memory module automatically pops out. Gently remove the memory module.
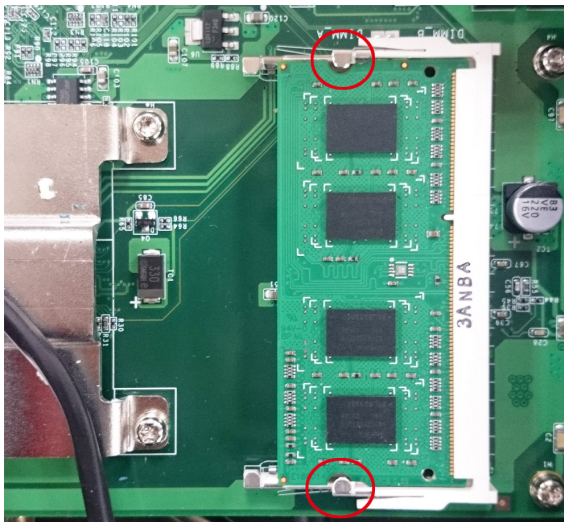
6. Remove a new memory module from its protective packaging.
7. Align the connectors on the memory module with the connectors on the slot and carefully slide the module into the slot at an angle; then, push it downwards.
    Make sure that the latches firmly engage the memory module to secure it in place.

8. After you have installed the new memory module, re-install the hardware components that you have removed in steps 1 to 4.

4

BIOS Setup

This chapter describes the BIOS settings of the MC-7270-DC-CP-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. All of the configurations will be stored in the battery backed up in CMOS RAM, which retains the system information after system reboots or the power is removed.

The following topics are covered in this chapter:

❒ **Entering the BIOS Setup Utility**
  ➢ Main Information
  ➢ Advanced Settings
  ➢ Boot Configuration
  ➢ Peripherals Configuration
  ➢ HDC Configuration: Storage Device BIOS Settings
  ➢ Video Configuration
  ➢ Chipset Configuration
  ➢ Hardware Monitor
❒ **Security Settings**
  ➢ Set Supervisor Password
❒ **Power Settings**
❒ **Boot Settings**
  ➢ Boot Type
  ➢ 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**.
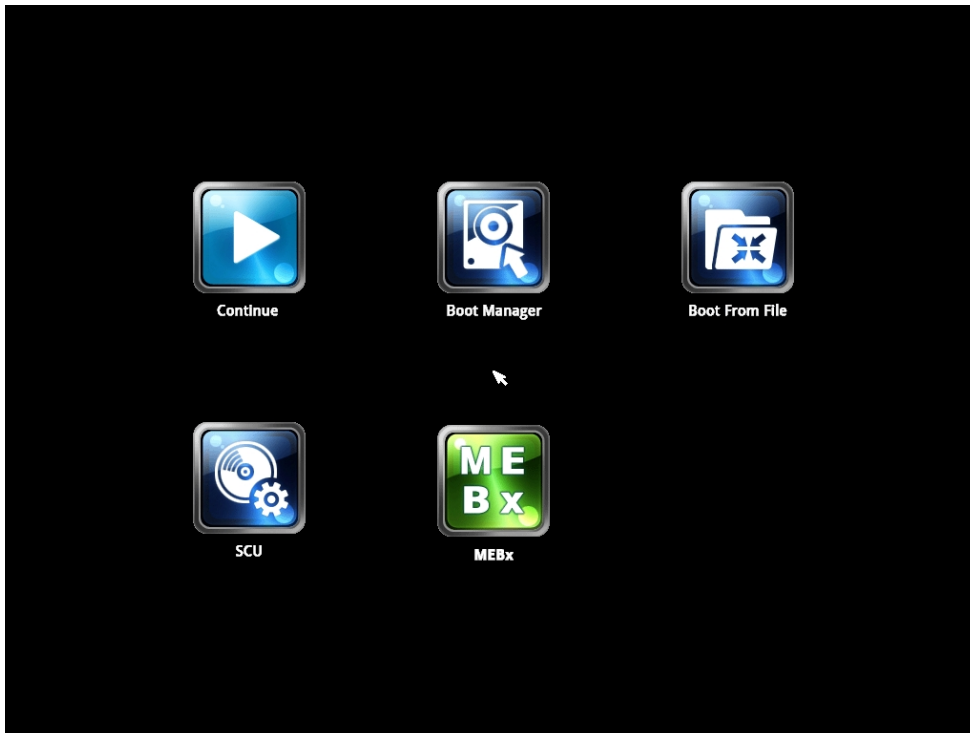
A basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to scroll about the screen, how to select by pressing "Enter," and how to use the other hot keys listed below.

F1: General Help

F5/F6: Change Values

F9: Setup Defaults

F10: Save and Exit

ESC: Exit

Main Information

The Main screen provides system information, including the model name, BIOS version, and CPU type. You can view basic system hardware information on this page.

```
                              InsydeH2O Setup Utility                        Rev. 3.7
 Main  Advanced  Security  Power  Boot  Exit

 MODEL NAME                     MC-7200                      This is the help for the hour, minute,
 BIOS Version                   V1.10S04                     second field. Valid range is from 0 to
 Processor Type                 Intel(R) Core(TM) i3-3120ME CPU @ 2.40GHz   23, 0 to 59, 0 to 59. INCREASE/REDUCE : +
 System Bus Speed               100 MHz                      /-.
 System Memory Speed            1333 MHz
 Cache RAM                      256 KB
 Total Memory                   2048 MB
 Channel A
 SODIMM 0                       [Not Installed]
 Channel B
 SODIMM 0                       2048 MB
 System Time                    [18:28:03]
 System Date                    [08/13/2014]




 F1  Help           ↑↓ Select Item      F5/F6 Change Values         F9   Setup Defaults
 Esc Exit           ↔  Select Menu      Enter Select ▶ SubMenu      F10  Save and Exit
```

Advanced Settings

Use the Advanced screen to configure advanced device settings (for example, boot settings).

```
                              InsydeH2O Setup Utility                        Rev. 3.7
 Main  Advanced  Security  Power  Boot  Exit

 ▶Boot Configuration                                         Configures Boot Settings.
 ▶Peripheral Configuration
 ▶HDC Configuration
 ▶Video Configuration
 ▶Chipset Configuration
 ▶Hardware Monitor




 F1  Help           ↑↓ Select Item      F5/F6 Change Values         F9   Setup Defaults
 Esc Exit           ↔  Select Menu      Enter Select ▶ SubMenu      F10  Save and Exit
```
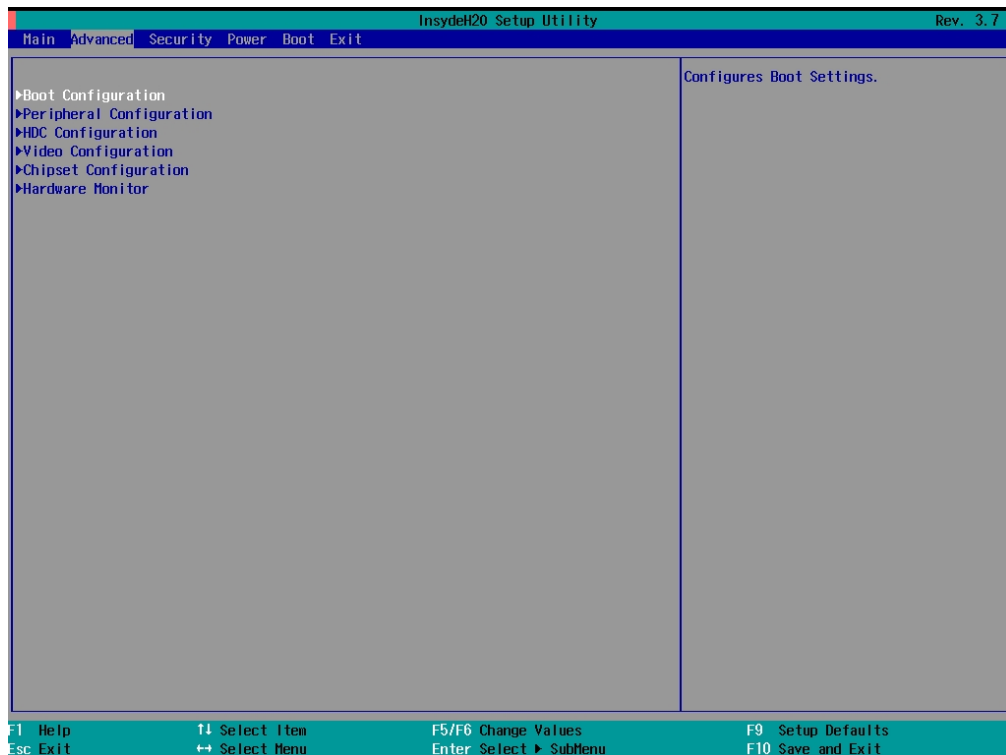
Boot Configuration

This screen allows you to configure the Numlock state.

```
                          InsydeH20 Setup Utility                      Rev. 3.7
     Advanced
 Boot Configuration                                   Selects Power-on state for Numlock

 Numlock                          <On>








 F1  Help            ↑↓ Select Item      F5/F6 Change Values     F9  Setup Defaults
 Esc Exit            ↔ Select Menu       Enter Select ▶ SubMenu  F10 Save and Exit
```
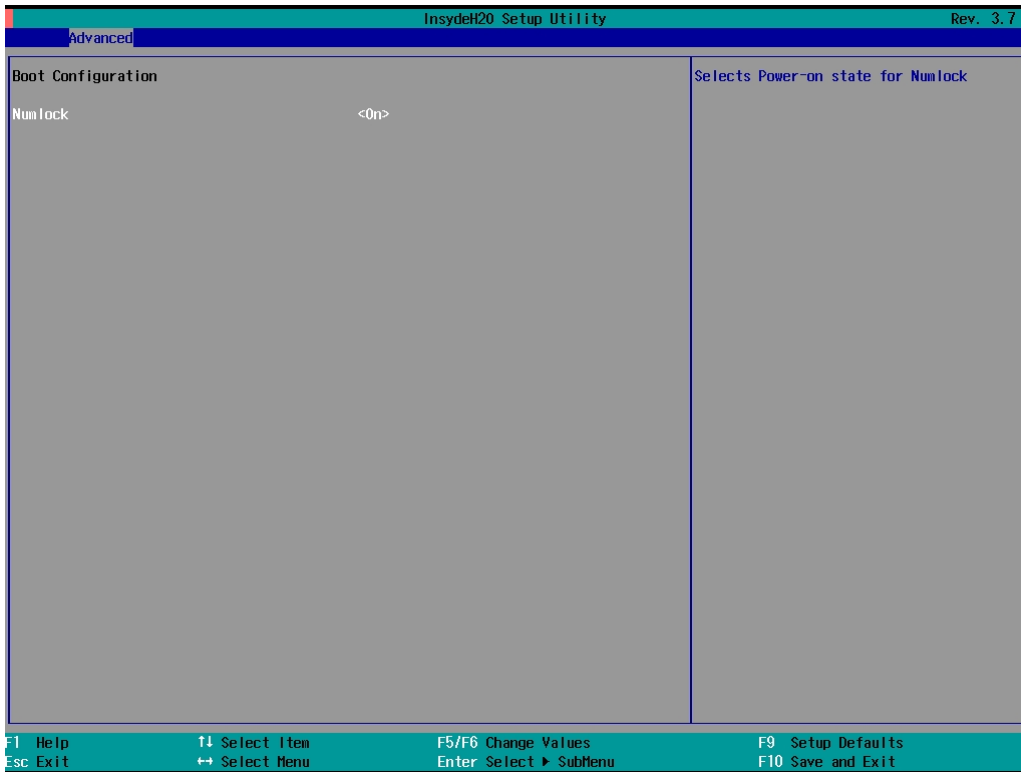
Option: On (default), Off.

Peripherals Configuration

This item allows you to configure the parallel port.

```
                          InsydeH20 Setup Utility                      Rev. 3.7
     Advanced
 Peripheral Configuration                             Configure Parallel port


 Parallel Port                    <378/IRQ7>
   Mode                           <SPP>








 F1  Help            ↑↓ Select Item      F5/F6 Change Values     F9  Setup Defaults
 Esc Exit            ↔ Select Menu       Enter Select ▶ SubMenu  F10 Save and Exit
```
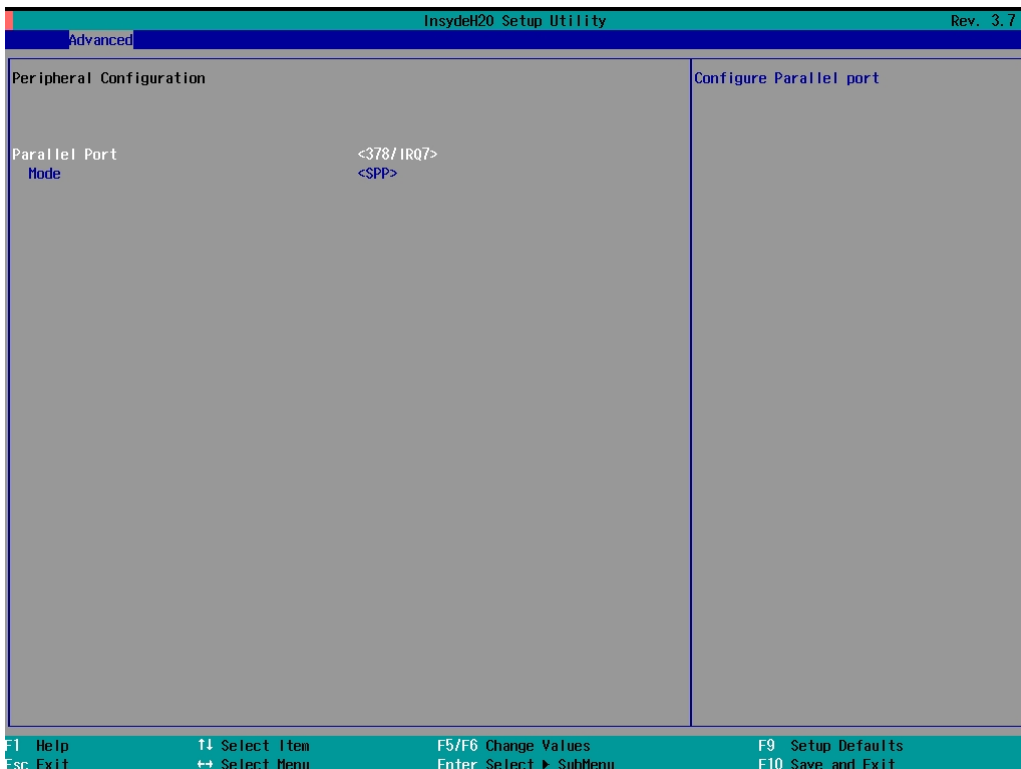
Parallel Port

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: Storage Device BIOS Settings

The HDC configuration section is where the BIOS settings for all storage devices are configured. There are three basic operation modes for storage drives: IDE, AHCI, and RAID. Most current systems will use AHCI or RAID mode.

IDE mode is configured by default; it is included for legacy operating systems that do not support SATA. AHCI is available for systems that want to use full SATA capabilities, but with only a single drive, or dual independent drives. RAID mode is available for systems that wish to configure two or more SATA drives in a RAID array.

HDC Configure As: Host Drive Controller Configuration

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

```
                                 InsydeH20 Setup Utility                              Rev. 3.7
     Advanced

 HDC Configuration                                          Set Harddisk Controller Configure Type

 HDC Configure As                    <IDE>

 ▶Serial ATA Port 0     [Not Installed]
 ▶Serial ATA Port 1     [Not Installed]
 ▶Serial ATA Port 2     [Not Installed]
 ▶Serial ATA Port 3     [64GB SATA Flash Driv]











 F1  Help              ↑↓ Select Item        F5/F6 Change Values         F9  Setup Defaults
 Esc Exit              ↔  Select Menu        Enter Select ▶ SubMenu      F10 Save and Exit
```

For normal SATA functionality, select AHCI. When this option is selected, AHCI SALP (Support Aggressive Link Power Management) may be enabled. The four SATA interfaces (0–3) will be highlighted; only the first two SATA ports are enabled by default, with port 0 enabling the removable drive tray on the front panel, and port 1 enabling the drive expansion slot accessed through the bottom panel. The figure below displays the AHCI configuration screen:

```
                          InsydeH20 Setup Utility                            Rev. 3.7
       Advanced

  HDC Configuration                                       Set Harddisk Controller Configure Type

  HDC Configure As                   <AHCI>
  AHCI SALP                          <Enabled>
  SATA Port 0 HotPlug                <Disabled>
  SATA Port 1 HotPlug                <Disabled>
  SATA Port 2 HotPlug                <Disabled>
  SATA Port 3 HotPlug                <Disabled>

  ▶Serial ATA Port 0     [Not Installed]
  ▶Serial ATA Port 1     [Not Installed]
  ▶Serial ATA Port 2     [Not Installed]
  ▶Serial ATA Port 3     [Not Installed]

  F1  Help              ↑↓ Select Item       F5/F6 Change Values        F9  Setup Defaults
  Esc Exit              ↔ Select Menu        Enter Select ▶ SubMenu     F10 Save and Exit
```

To enable a RAID array, two SATA storage drives must be installed on the first two ports. AHCI SALP may also be enabled from the RAID screen.

```
                          InsydeH20 Setup Utility                            Rev. 3.7
       Advanced

  HDC Configuration                                       Set Harddisk Controller Configure Type

  HDC Configure As                   <RAID>
  ▶Software Feature Mask Configuration
  AHCI SALP                          <Enabled>
  SATA Port 0 HotPlug                <Disabled>
  SATA Port 1 HotPlug                <Disabled>
  SATA Port 2 HotPlug                <Disabled>
  SATA Port 3 HotPlug                <Disabled>

  ▶Serial ATA Port 0     [Not Installed]
  ▶Serial ATA Port 1     [Not Installed]
  ▶Serial ATA Port 2     [Not Installed]
  ▶Serial ATA Port 3     [Not Installed]

  F1  Help              ↑↓ Select Item       F5/F6 Change Values        F9  Setup Defaults
  Esc Exit              ↔ Select Menu        Enter Select ▶ SubMenu     F10 Save and Exit
```

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

```
                              InsydeH20 Setup Utility                            Rev. 3.7
        Advanced

 Software Feature Mask Configuration                          Enable/Disable RAID0 feature.

 RAID0                             <Enable>
 RAID1                             <Enable>
 RAID10                            <Enable>
 RAID5                             <Enable>
 Intel Rapid Recovery Technology   <Enable>
 OROM UI and BANNER                <Enable>




 F1  Help           ↑↓ Select Item      F5/F6 Change Values         F9  Setup Defaults
 Esc Exit           ↔ Select Menu       Enter Select ▶ SubMenu      F10 Save and Exit
```
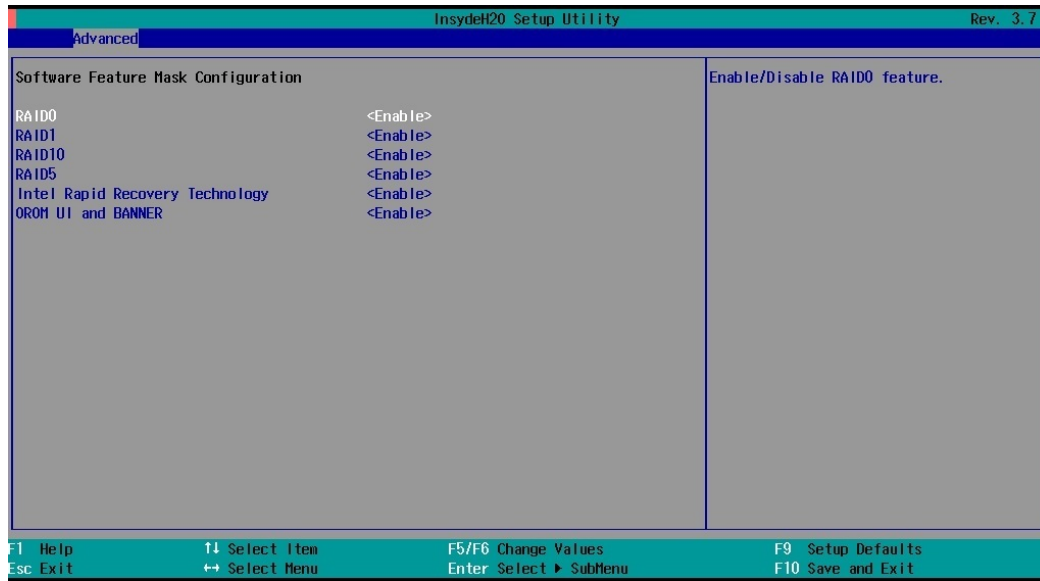
RAID 0 is a simple striping of information across two drives. It offers marginal improvements in access times for substantial sacrifices in system reliability.

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 drive 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, be aware of the potential for encountering the RAID 5 write hole problem, and take precautions against it.

AHCI SALP

This item allows you to enable aggressive "Supports Aggressive Link Power" (SALP) management 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.

Options: Enabled (default), Disabled

SATA Ports 0 to 3—HotPlug

This item allows you to enable/disable hotplug functionality (the ability to remove the drive while the computer is running) of installed storage drives.
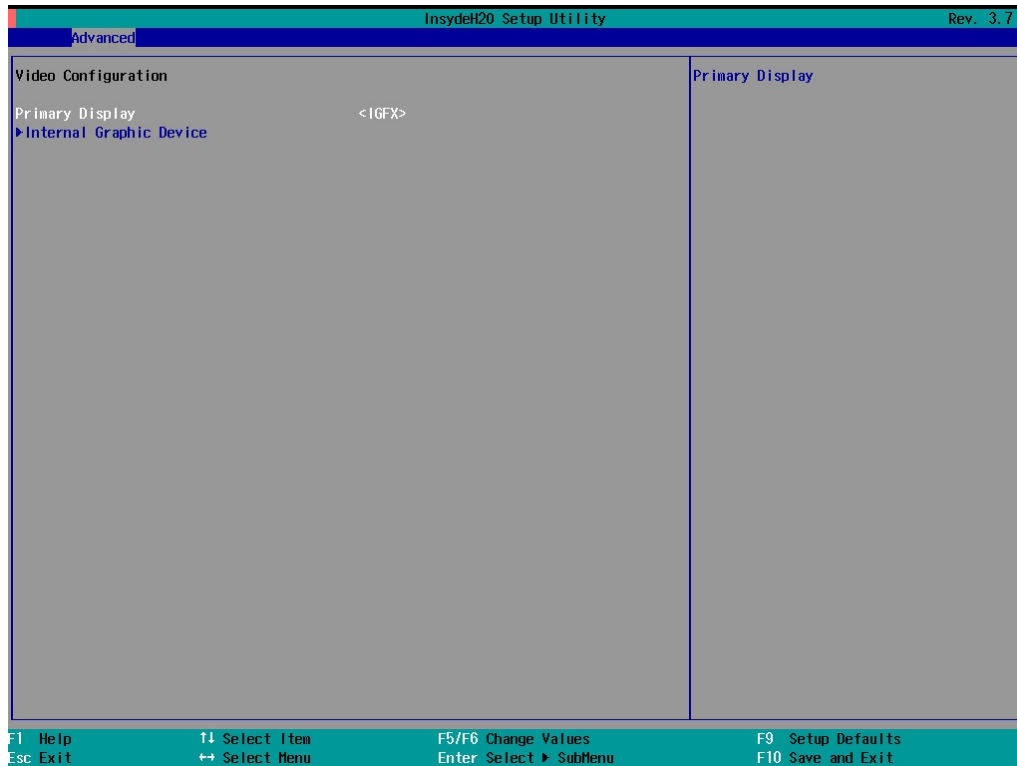
Options: Disable (default), Enabled

Serial ATA Port 0 to 3

This setting allows you to configure the type of the storage drive installed in the computer. Only the first two ports (ports 0 and 1) will be available for use: port 0 represents the removable drive tray on the front panel, while port 1 represents the drive expansion slot accessed from the bottom panel.

Options: Auto (default), User Defined

Video Configuration

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

```
                              InsydeH20 Setup Utility                         Rev. 3.7
   Advanced

 Video Configuration                                          Primary Display

 Primary Display                    <IGFX>
 ▶Internal Graphic Device




















 F1  Help              ↑↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
 Esc Exit              ↔  Select Menu       Enter Select ▶ SubMenu    F10 Save and Exit
```

IGD—DVMT Pre-Allocated

Options: 64 MB (default), 32 MB, 96 MB, 128 MB, 256 MB, 512 MB
From Intel: 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."
This item allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

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.

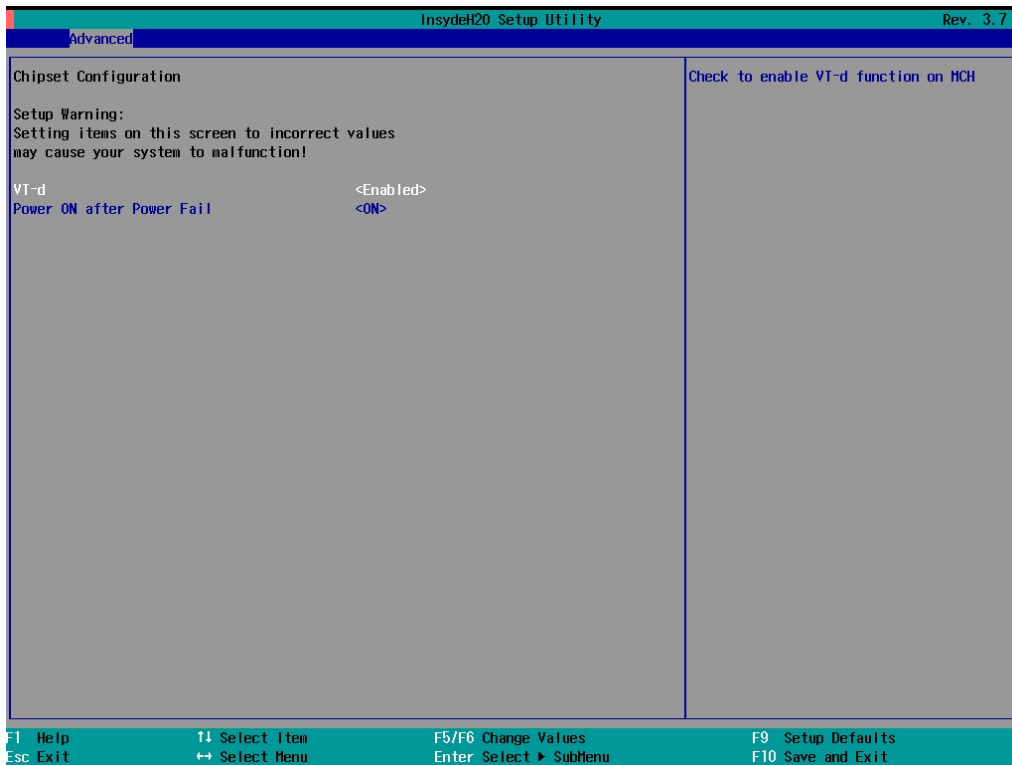Options: 256 MB (default), 128 MB, Max.

IGD—Boot Type

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

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

Chipset Configuration

This item allows you to configure the chipset settings.

```
                              InsydeH20 Setup Utility                        Rev. 3.7
    Advanced

 Chipset Configuration                                    Check to enable VT-d function on MCH

 Setup Warning:
 Setting items on this screen to incorrect values
 may cause your system to malfunction!

 VT-d                              <Enabled>
 Power ON after Power Fail         <ON>


 F1  Help            ↑↓ Select Item     F5/F6 Change Values        F9  Setup Defaults
 Esc Exit            ↔ Select Menu      Enter Select ▶ SubMenu     F10 Save and Exit
```

VT-d

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

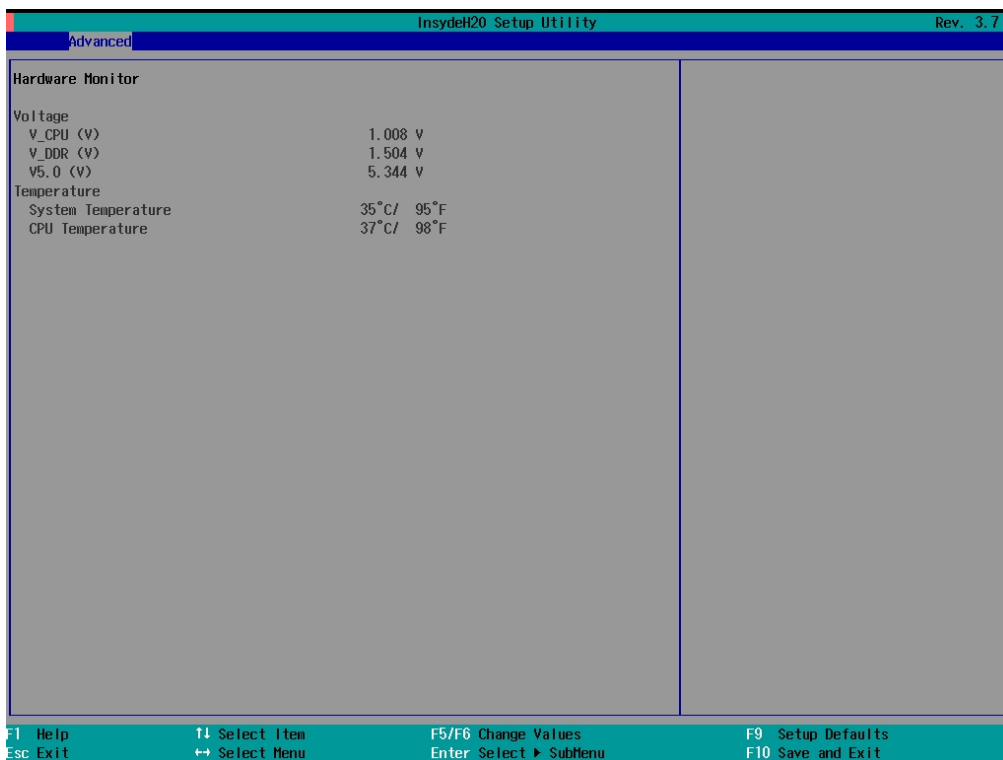Options: Enable (default), Disable

Power ON after Power Fail

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

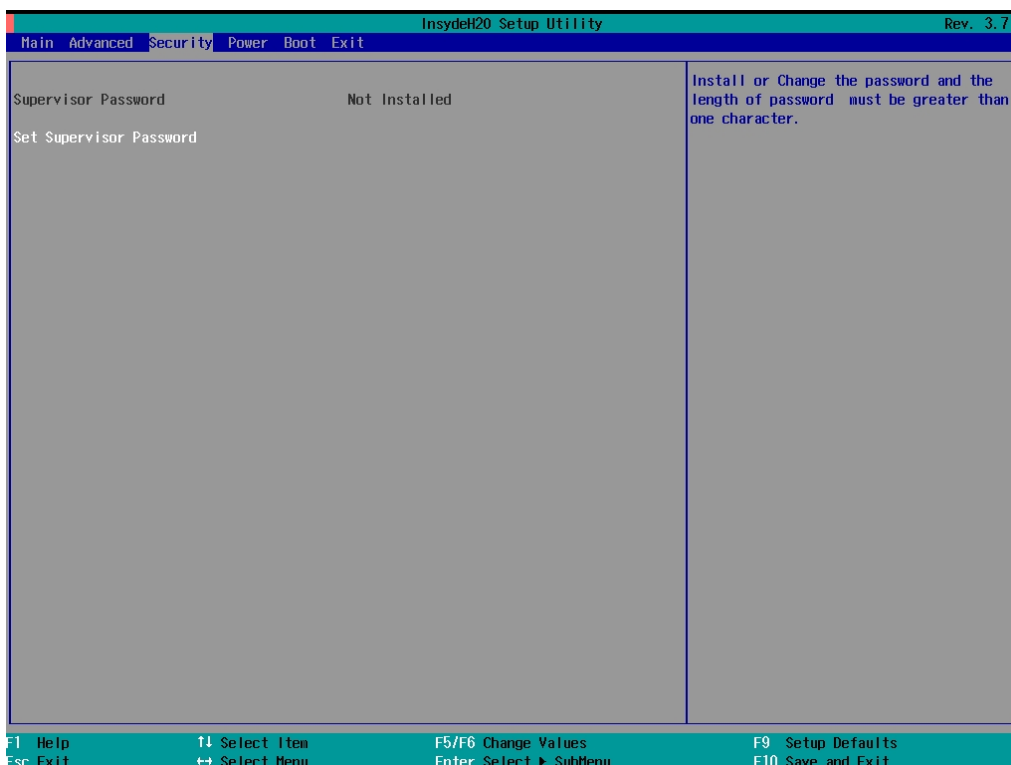Options: ON (default), OFF, Last State

Hardware Monitor

This item allows you to view stats like CPU and system temperature, voltage levels, and other chipset information.

```
                                       InsydeH20 Setup Utility                          Rev. 3.7
          Advanced

Hardware Monitor

Voltage
   V_CPU (V)                         1.008 V
   V_DDR (V)                         1.504 V
   V5.0 (V)                          5.344 V
Temperature
   System Temperature            35°C/  95°F
   CPU Temperature               37°C/  98°F




F1  Help              ↑↓ Select Item      F5/F6 Change Values        F9  Setup Defaults
Esc Exit              ↔ Select Menu       Enter Select ▶ SubMenu     F10 Save and Exit
```

Security Settings

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

```
                                       InsydeH20 Setup Utility                          Rev. 3.7
 Main  Advanced  Security  Power  Boot  Exit

                                                         Install or Change the password and the
 Supervisor Password               Not Installed         length of password  must be greater than
                                                         one character.
 Set Supervisor Password




F1  Help              ↑↓ Select Item      F5/F6 Change Values        F9  Setup Defaults
Esc Exit              ↔ Select Menu       Enter Select ▶ SubMenu     F10 Save and Exit
```
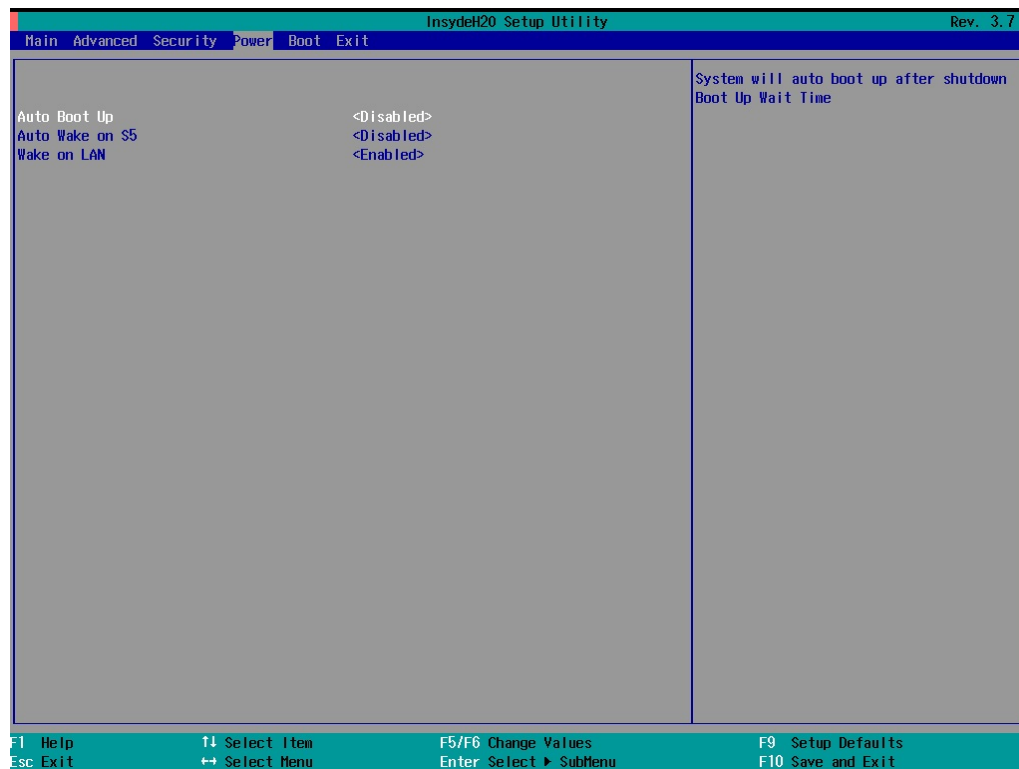
Set Supervisor Password

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

To cancel the password, enter Set Supervisor Password item, and then enter the old password. Leave the new password fields blank, and then press enter.

Power Settings

The section allows users to configure power settings.

```
                              InsydeH20 Setup Utility                          Rev. 3.7
 Main  Advanced  Security  Power  Boot  Exit

                                                    System will auto boot up after shutdown
                                                    Boot Up Wait Time
 Auto Boot Up                   <Disabled>
 Auto Wake on S5                <Disabled>
 Wake on LAN                    <Enabled>




F1  Help            ↑↓ Select Item        F5/F6 Change Values        F9  Setup Defaults
Esc Exit            ↔ Select Menu         Enter Select ▶ SubMenu     F10 Save and Exit
```

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.

```
                              InsydeH20 Setup Utility                              Rev. 3.7
  Main  Advanced  Security  Power  Boot  Exit

                                                          Select boot type to Dual type, Legacy
  Boot Type                    <Dual Boot Type>           type or UEFI type
  PXE Boot to LAN              <Disabled>
  Add Boot Options             <Last>
  USB Boot                     <Enabled>
  EFI Device First             <Disabled>
  Boot Delay Time              <0 Second>

  ▶Legacy










  F1  Help            ↑↓ Select Item       F5/F6 Change Values        F9  Setup Defaults
  Esc Exit            ↔ Select Menu        Enter Select ▶ SubMenu     F10 Save and Exit
```
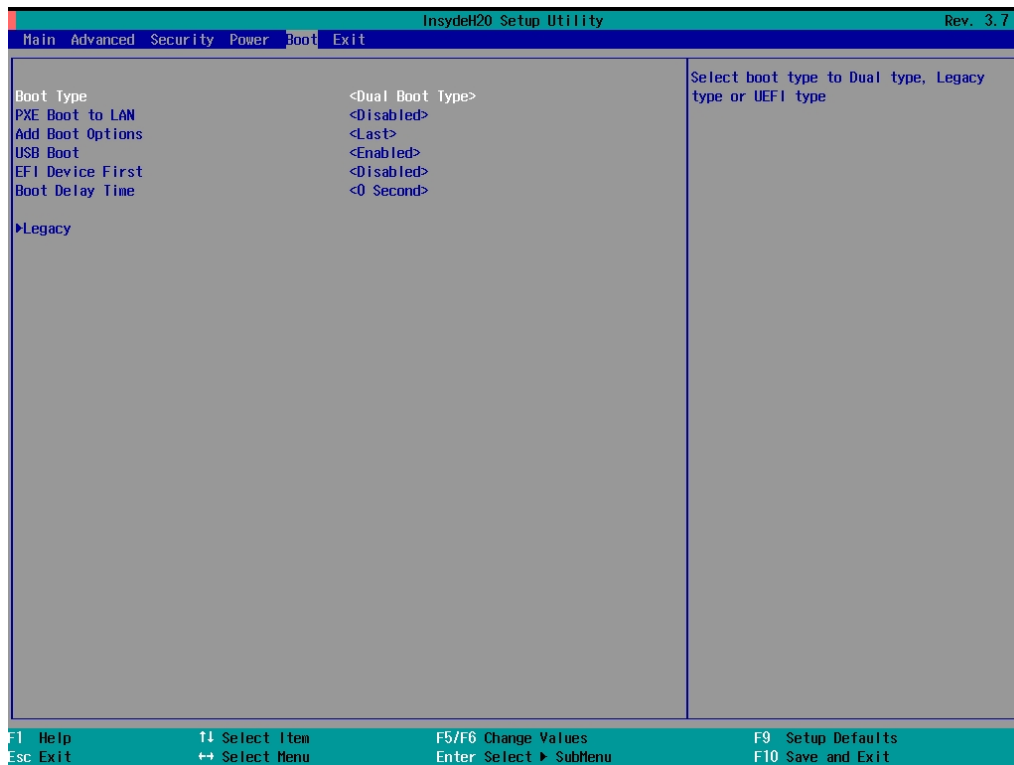
Boot Type

This function sets the system OS to boot from EFI or Legacy.

Options: Dual Boot Type (Default), Legacy Boot Type, UEFI Boot Type

PXE Boot to LAN

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

Options: Disabled (default), Enabled

Add Boot Options

This item allows you to add a boot entry when system detects a new boot device.

Options: Last (default), First

USB Boot

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

Options: Enabled (default), Disabled

EFI Device First

Sets the EFI device boot priority.

Options: Disabled (default)

Boot Delay Time

Sets the BIOS boot delay time for information checking.

Options: 0 sec (default), 3 sec, 5 sec, 10 sec

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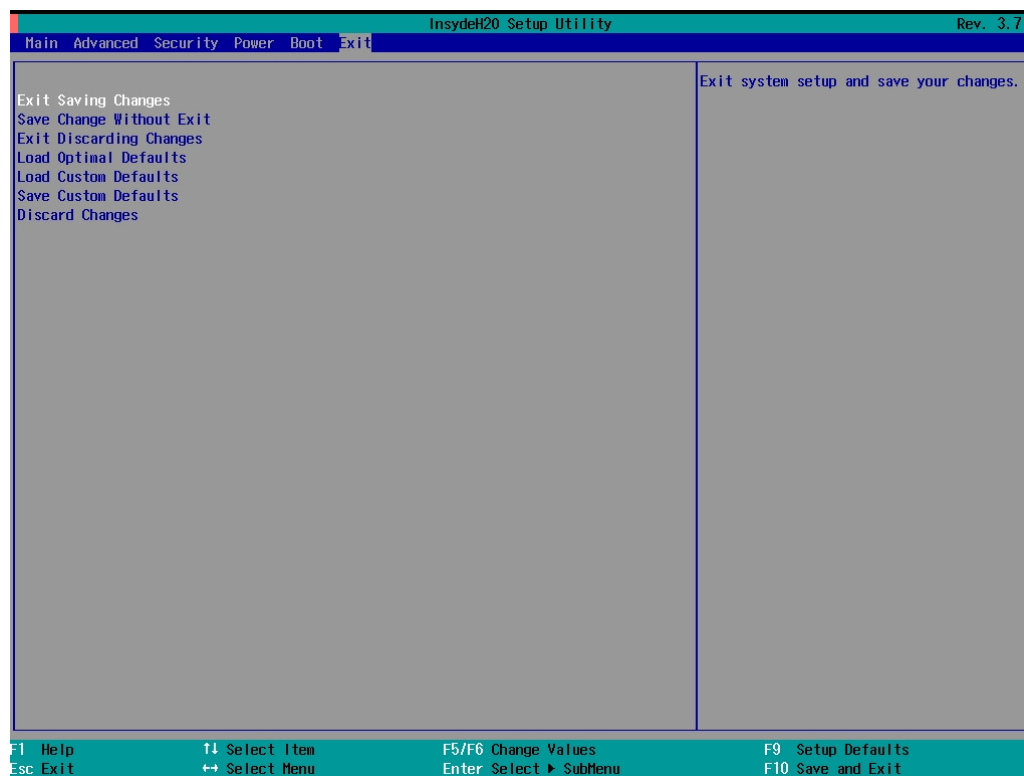
Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, LAN

Hard Disk Drive

This item allows you to view the hard disk drive installed in the computer.

Exit Settings

The section allows users to exit the BIOS environment.

```
                           InsydeH2O Setup Utility                           Rev. 3.7
  Main  Advanced  Security  Power  Boot  Exit

                                                      Exit system setup and save your changes.
  Exit Saving Changes
  Save Change Without Exit
  Exit Discarding Changes
  Load Optimal Defaults
  Load Custom Defaults
  Save Custom Defaults
  Discard Changes


















  F1  Help              ↑↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
  Esc Exit              ↔  Select Menu       Enter Select ▶ SubMenu    F10 Save and Exit
```

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 can be reverted to at any time with 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.
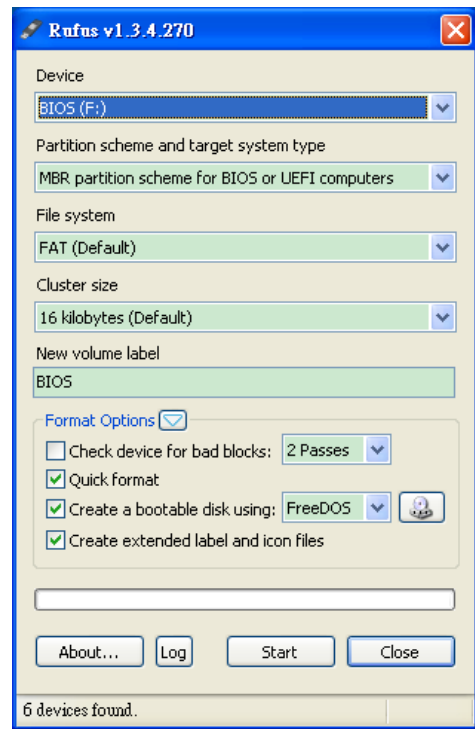
⚠️ **ATTENTION**

We suggest you use a USB drive with under 2 GB in disk space, as 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 support department for assistance.

1. Get the BIOS upgrade installation file. The file name should have the 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-DC-CP-T Computer

1. Reboot the computer, and press **F2** during the startup process and select 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>MC7270S03.exe
```

5. The upgrade program will run automatically. Please wait patiently until the procedure finishes.

```
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
```

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.

B

Adjusting the Audio Mixer Function

This chapter describes how to adjust the audio settings for the MC-7270-DC-CP-T's Mixer function under 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 to do this:
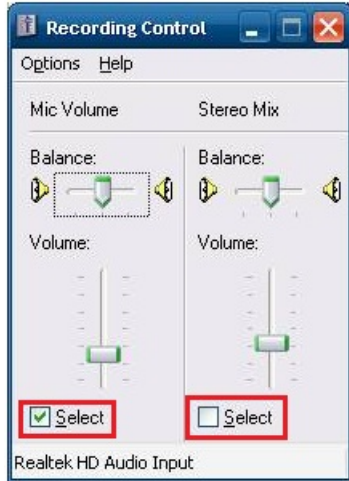
1. Right-click the volume icon and select **Open Volume Control**.
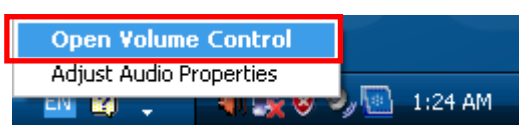
2. Select **Properties**.
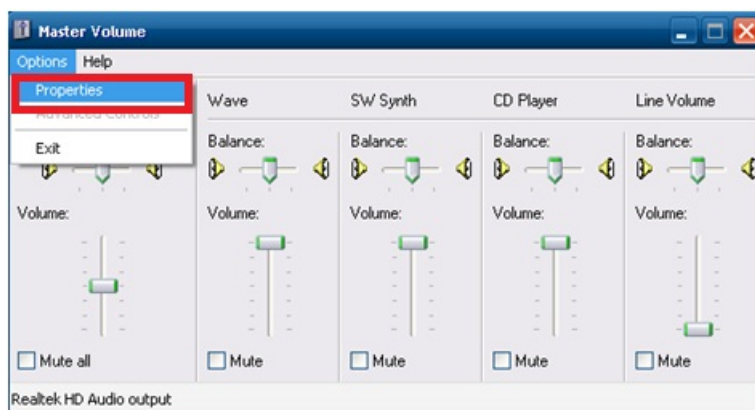
3. Select **Realtek HD Audio Input** from the Mixer device drop-down list, and check **Stereo Mix**. Click **OK** to continue.
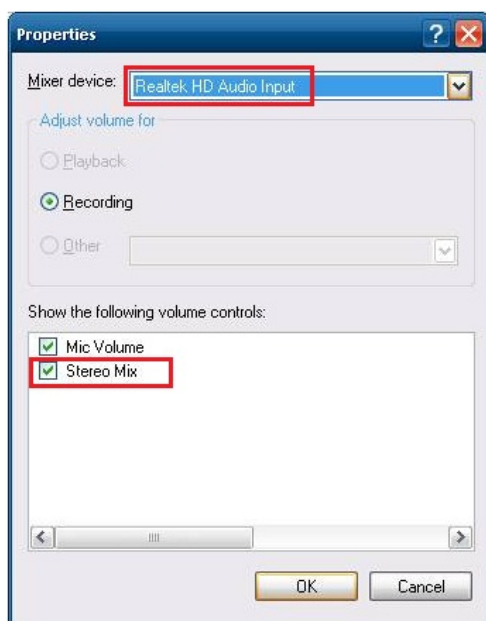
4. Uncheck the Select checkbox under Stereo Mix and check the Select checkbox under Mix Volume to complete the configuration.

C

Configuring the Serial Ports

This chapter shows how to configure the 3-mode serial ports, COM3 and COM4, using the application on the product CD. The path to the application is **<Software DVD>\MC-7270-DC-CP-T\utility\mxsif**
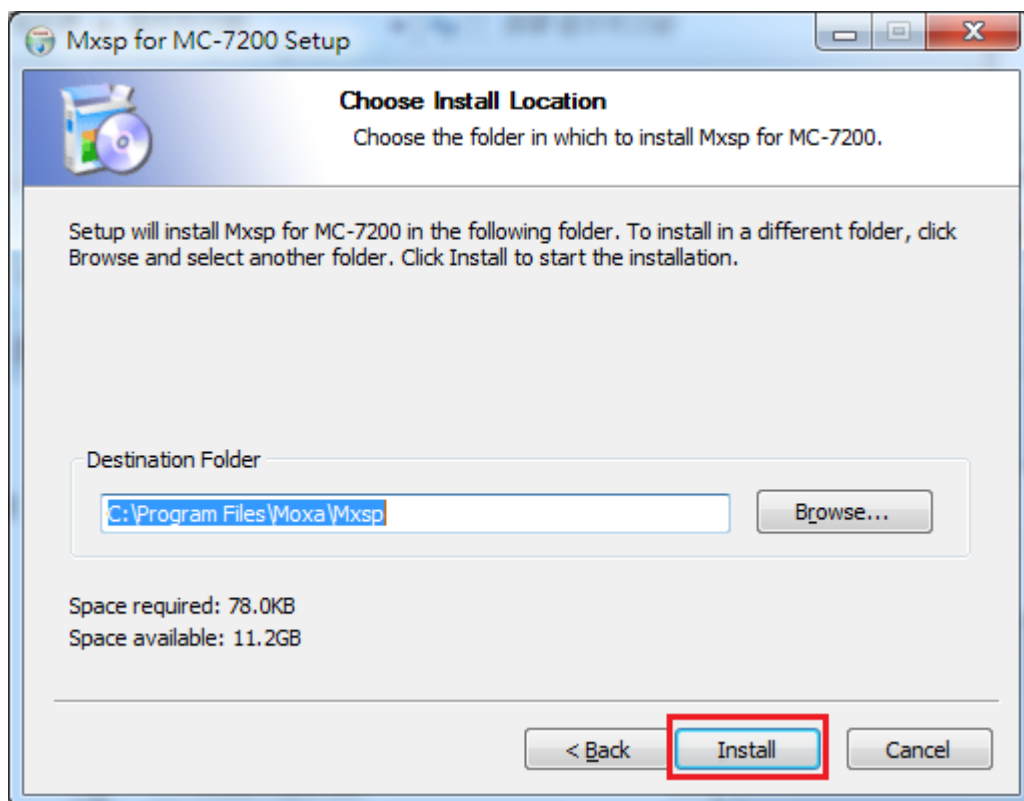
How to Install the Application

1. Double click the utility **Mxsp_MC-7200_1.0_x64_Setup**. When the following setup message appears, click **Next >** to proceed.
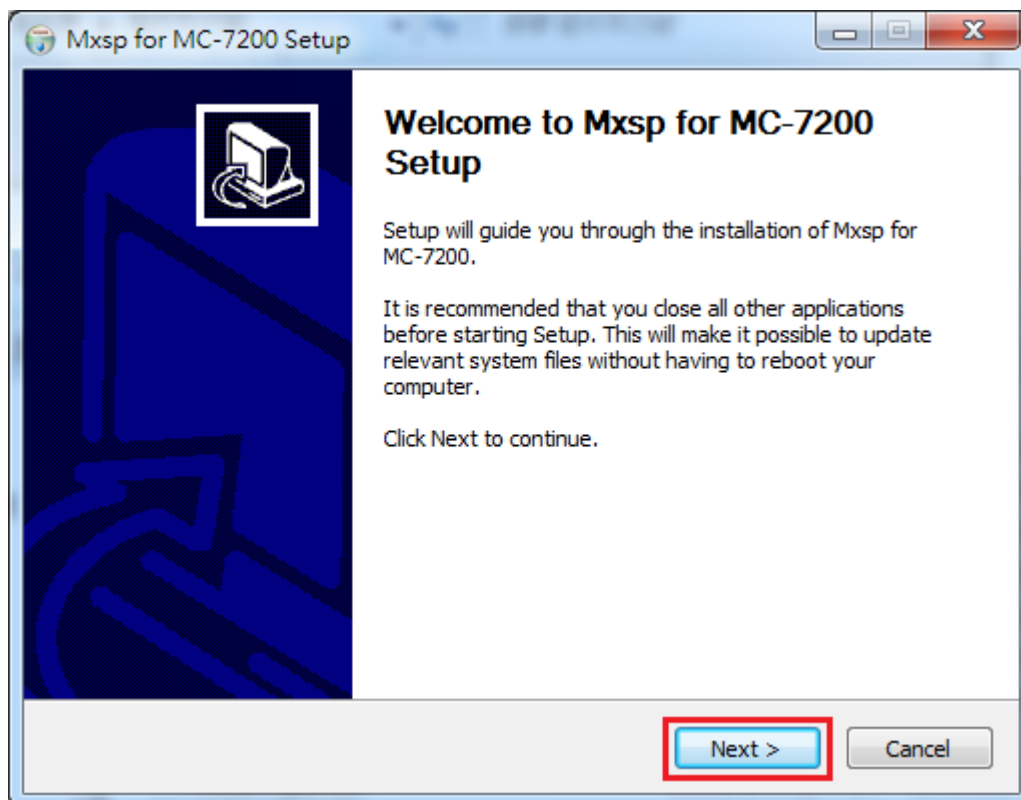
2. Select **Install for anyone using this computer** or **Install just for me** and then click **Next >** to proceed.
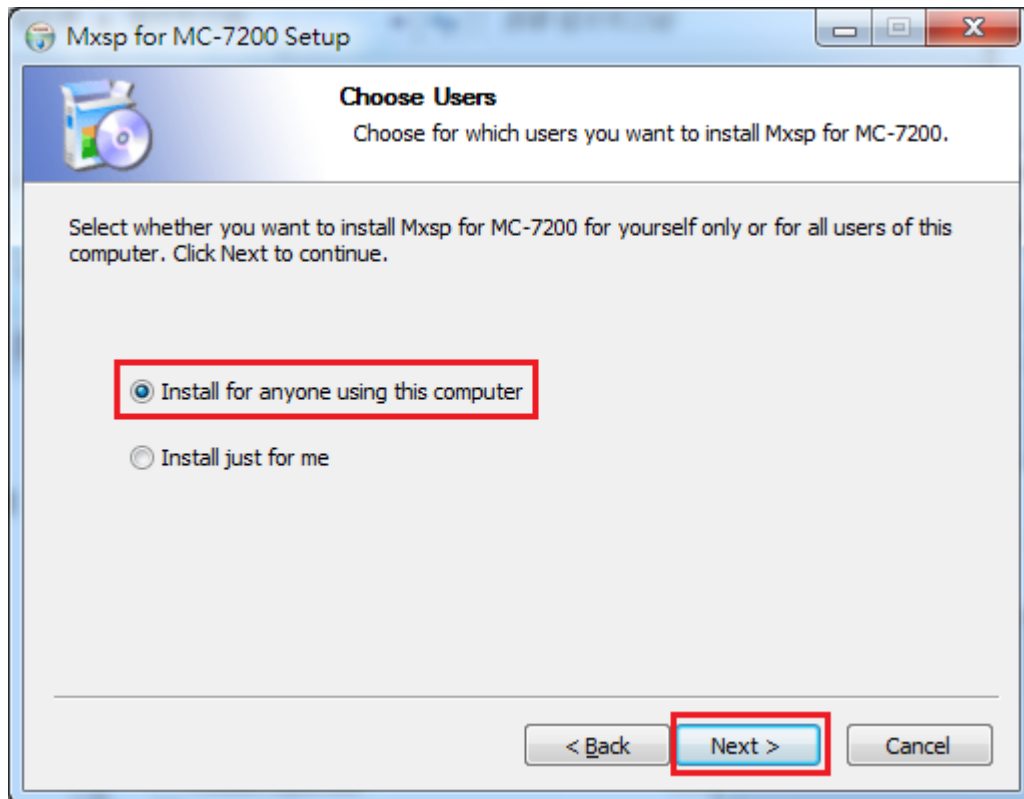
3. Specify which folder on this computer you would like the application to be installed in, and then click **Install**.

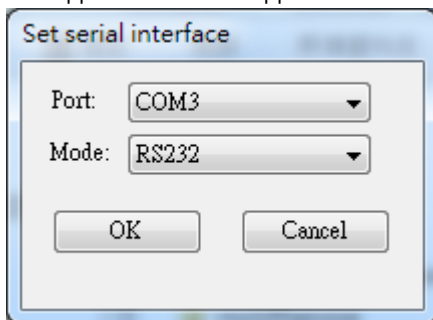4. Click **Finish** to complete the installation process.
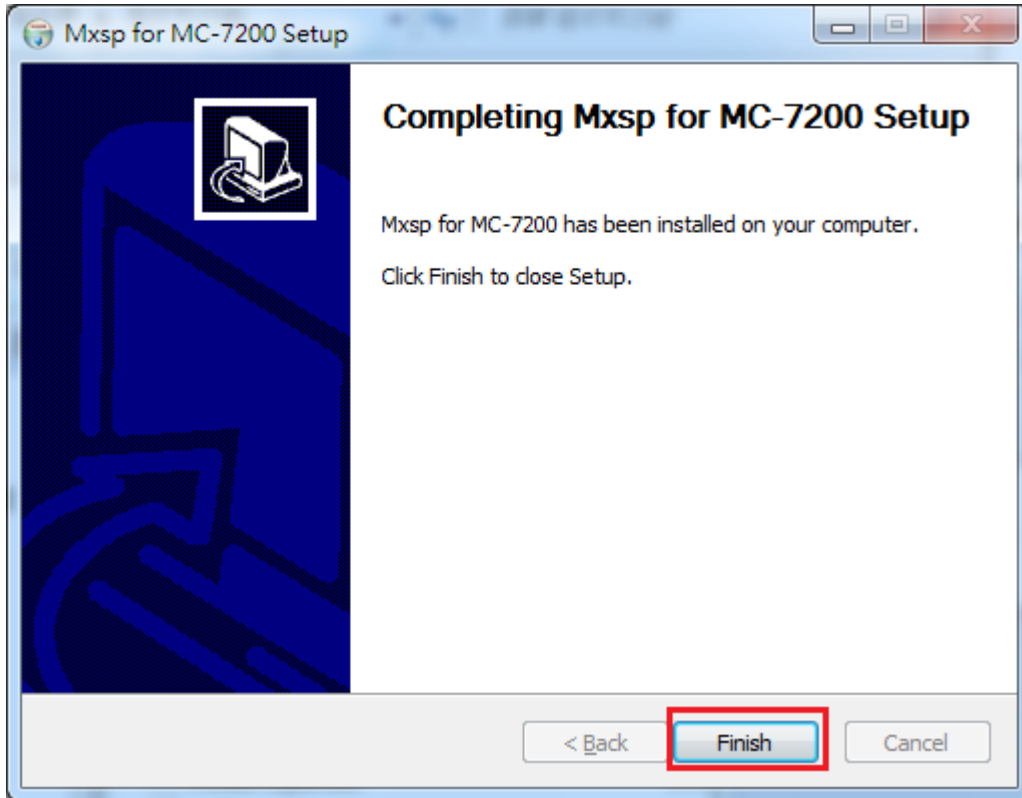
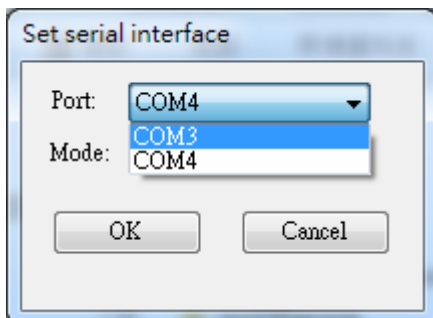# How to Use the "mxSerialInterface" Utility

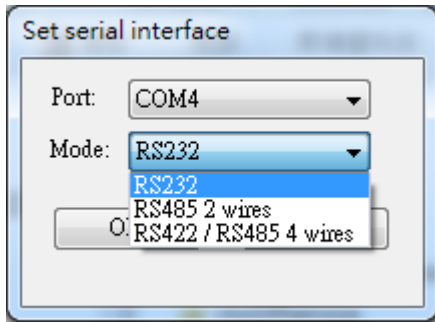1. Double click the **mxSerialInterface** icon.

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.