MC-1100 Series
Hardware User's Manual

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www.moxa.com/product

MOXA®

MC-1100 Series
Hardware User's Manual

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Introduction

The Moxa MC-1100 series DIN-rail, fanless, x86 embedded computers are based on the Intel® Atom™ E3800 series processor, feature the most reliable I/O design to maximize connectivity, and support wireless modules (Wi-Fi/3G/LTE), making them suitable for a diverse range of communication applications.

With a wide operating temperature range (-40 to 70°C) and compliance with safety, EMI, and EMS standards, the MC-1100 series is ideal for intelligent computing and communication solutions operating in critical environments, including marine communication, oil & gas field site monitoring, and transportation.

The MC-1100 series supports "Moxa Hardware Monitoring" for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Closely monitoring the system status makes it easier to recover from errors and provides the most reliable platform for your applications.

The following topics are covered in this chapter:

❒ **Package Checklist**
❒ **Product Features**
❒ **MC-1100 Hardware Specifications**
❒ **Hardware Block Diagram**

Package Checklist

Each model is shipped with the following items:

- MC-1100 embedded computer
- Terminal block to power jack converter
- Din-rail mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

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

Product Features

MC-1100 embedded computers support the following features:

- Intel Atom Quad-core E3845 processor
- -40 to 70°C system operating temperature
- One mini-PCIe socket for wireless modules: Wi-Fi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: Up to 2 serial ports, 4 Ethernet LAN ports, 4 DIs, 4 DOs, SD slot, 2 USB ports, VGA port, display port, wireless
- Certified for mission-critical environments: IEC-60945, DNV, UL C1D2, ATEX/ IECEx*
- Windows 7 Embedded and Debian 7/8** platform support
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa Smart Recovery utility to recover system from boot failure (W7E only)

*All mission-critical certifications are pending.
**Debian 7 and 8 models are under development.

MC-1100 Hardware Specifications

Computer

CPU:

- MC-1100-E4 Series: Intel® Atom™ processor E3845 (quad-core, 1M cache, 1.91 GHz)
- MC-1100-E2 Series: Intel® Atom™ processor E3826 (dual-core, 1M cache, 1.46 GHz)

System Memory: 1 DDR3L SO-DIMM slot, 2 GB pre-installed; support 2 GB, 4 GB, and 8 GB.

USB: USB 2.0 hosts x 2, Type A connectors

Storage:

- CFast: 1 CFast socket for OS storage; CFast supports 16 GB, 32 GB, 64 GB, and 128 GB.
- SD: 1 SD 3.0 (SDHC/SDXC) socket for storage expansion; SD supports 16 GB, 32 GB, 64 GB, and 128 GB.

Operating System: Supports Windows 7 Embedded 32/64 bits and Linux Debian 8*

*The Linux Debian 8 model is still under development.

Other Peripherals

USB: 2 bootable USB 2.0 ports (type A)

Expansion Slots: 1 MiniPCIe socket; USB signal for wireless Wi-Fi/3G/LTE modules

USIM Slots: 1

Display

Display Interface:

- VGA interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1200 pixels at 75 Hz
- Display port interface x 1: Display port connector, with resolution up to 2560 x 1600 pixels at 60 Hz

Graphics Controller: Intel® HD Graphics 4000

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)

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: DIs x 4, source-type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

• Logic level 0: Close to GND

• Logic level 1: Open

Digital Input Levels for Wet Contacts:

• Logic level 1: +3 V max

• Logic level 0: +10 V to +30 V (Source to DI)

Connector Type: 10-pin screw-fastened Euroblock terminal

Isolation: 3 kV optical isolation

Digital Output
Output Channels: DOs x 4, sink-type

Output Current: 200 mA (max.) per channel

On-State Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw-fastened Euroblock terminal

Isolation: 3 kV optical isolation

LEDs
System: Power

Storage: CFast, SD

LAN: 2 LEDs per port (100/1000 Mbps)

Serial: 2 LEDs per port (Tx and Rx)

Physical Characteristics
Housing: Aluminum, sheet metal

Weight:

• MC-1111: 1.21 kg (2.69 lb)

• MC-1121: 09.7 g (2.16 lb)

Dimensions:

• MC-1111: 132 x 122 x 68 mm (5.20 x 4.81 x 2.68 in)

• MC-1121: 132 x 122 x 87 mm (5.20 x 4.81 x 3.43 in)

Mounting: DIN rail, wall (optional)

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

Storage Temperature: -40 to 75°C (-40 to 158°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

Power Requirements
Input Voltage: 12/24 VDC typical (11.4 to 36 VDC tolerance, 2-pin terminal block)

Power Consumption: Less than 30 W

Standards and Certifications

Safety: UL 60950-1, CCC

Hazardous Environments: Class 1 Division 2*

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 Standards: IEC 60945 4th

Marine Type Approval: DNV 2.4*

Green Product: RoHS, cRoHS, WEEE

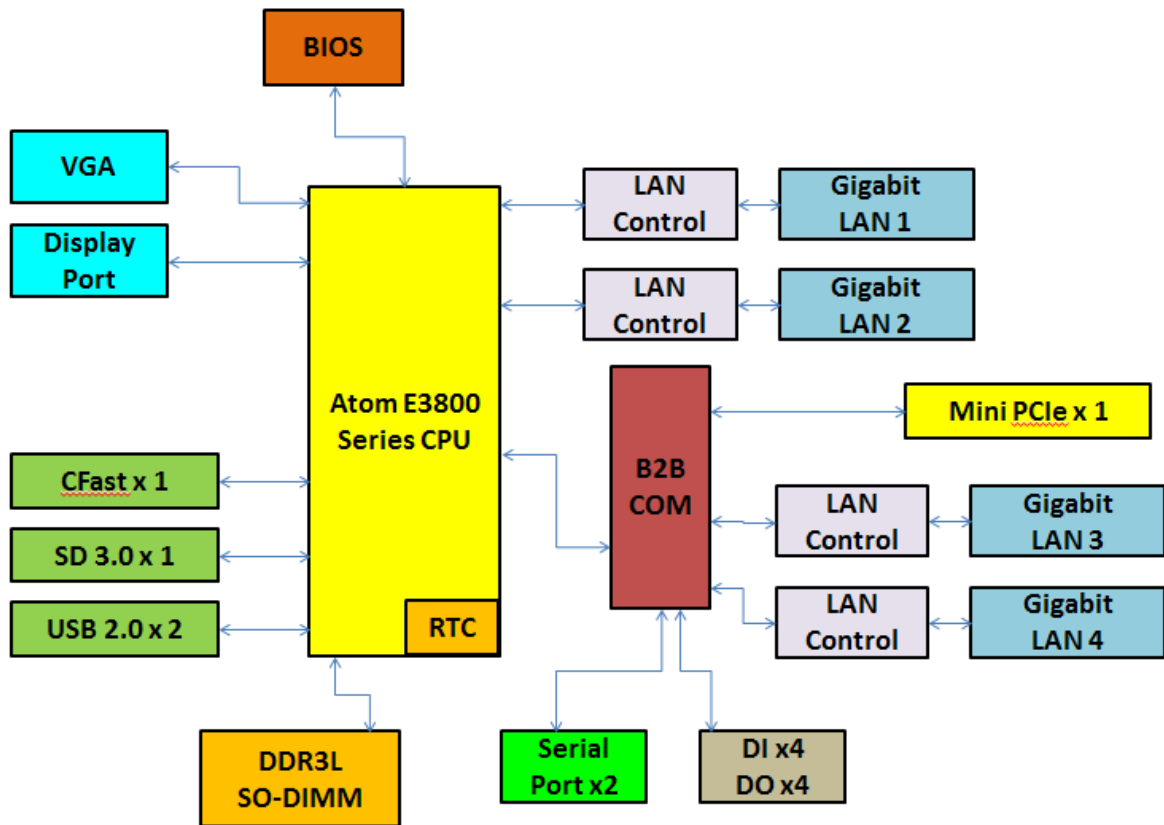***DNV 2.4 and UL Class 1 Division 2 are pending**

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

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Hardware Introduction

The MC-1100 series embedded computers are compact, well-designed, and 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-1111
  ➢ MC-1121
❏ **Dimensions (unit = mm (inch))**
  ➢ MC-1111
  ➢ MC-1121
❏ **LED Indicators**
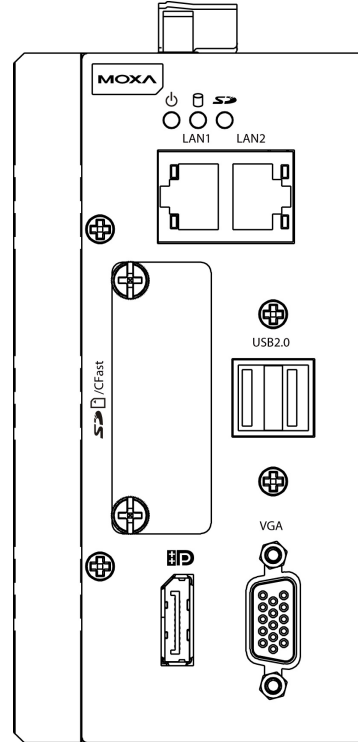
Appearance

MC-1111
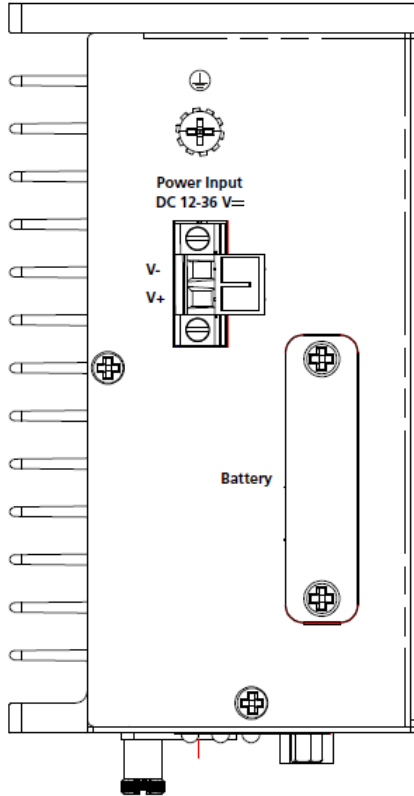
Top View
      Front View

MC-1121

Top View
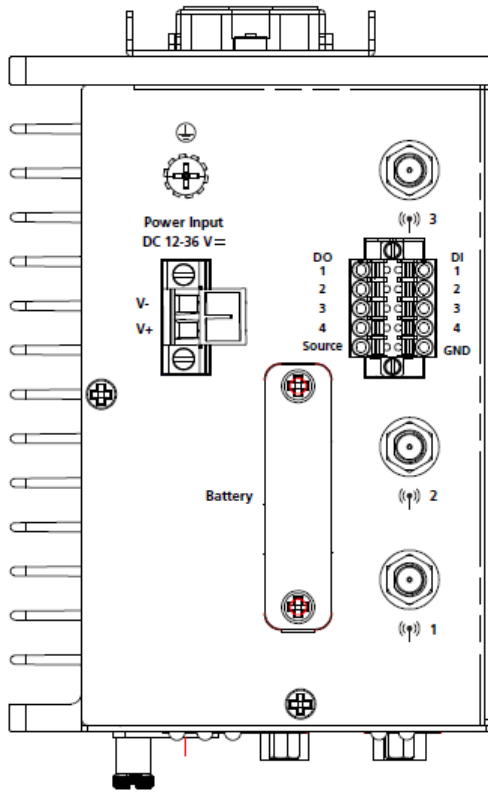
Front View
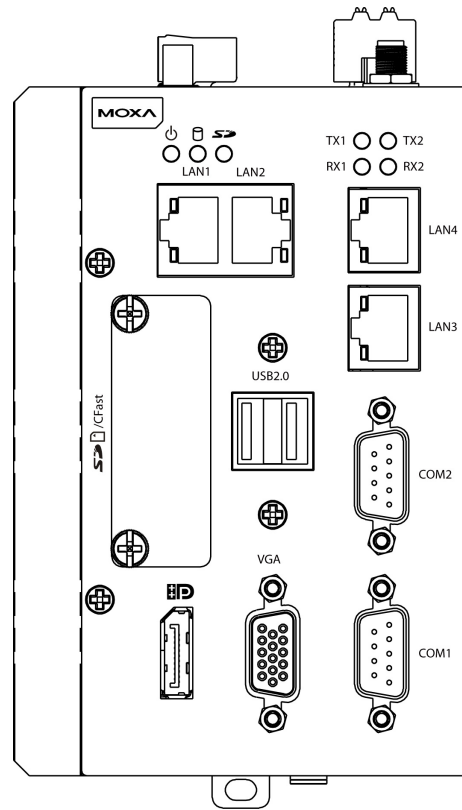
Rear View

Dimensions (unit = mm (inch))

MC-1111

122 (4.80)

68 (2.68)

132 (5.20)

MC-1121

122 (4.80)

87 (3.43)

132 (5.20)
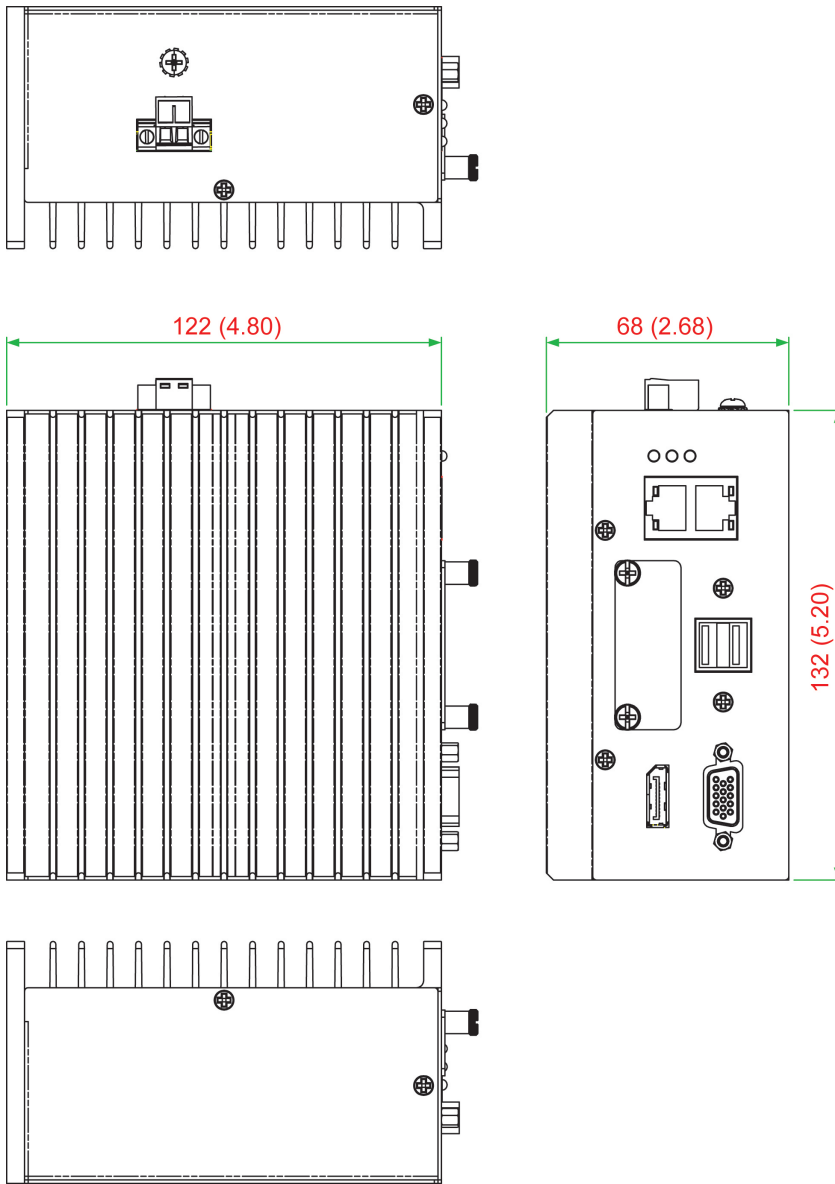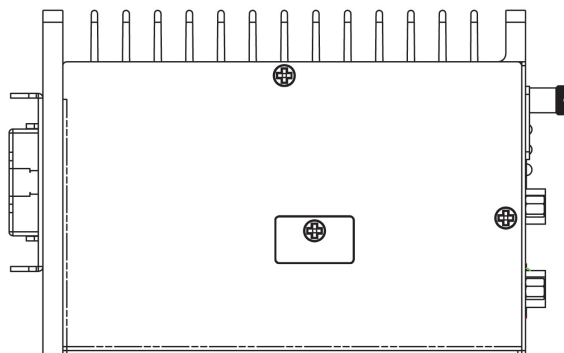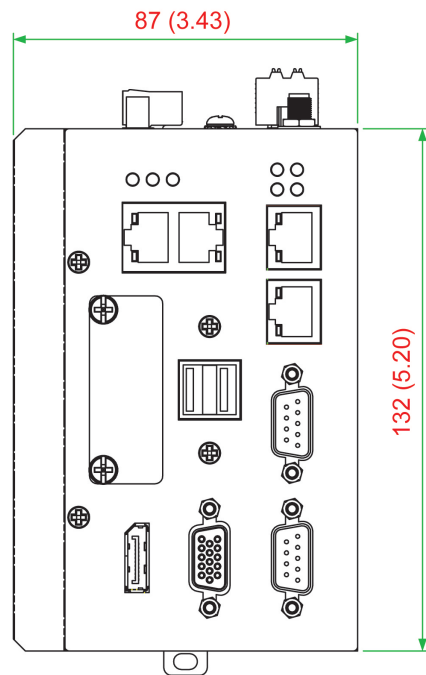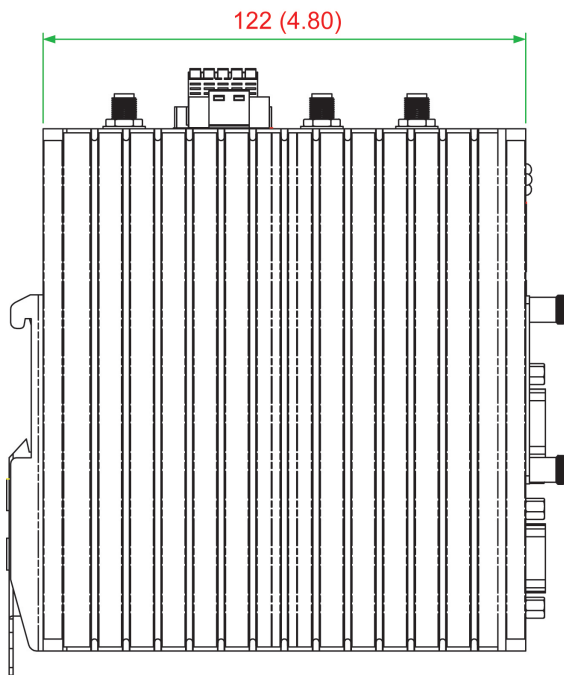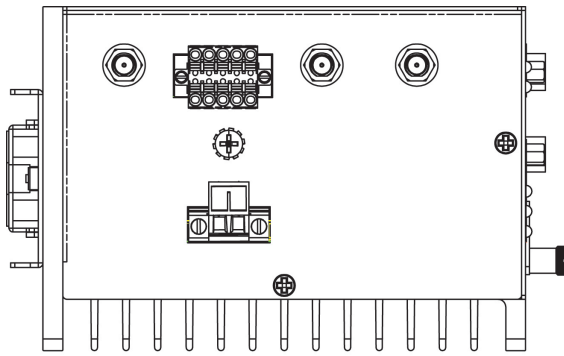
LED Indicators

LED Name		Status	Function
Power		Green	Power is on and computer is function normally.
		Off	Power is off.
Storage 1 (CFast)		Yellow	Blinking: Data is being transmitted.
		Off	No data transmission.
Storage 2 (SD)		Yellow	Blinking: Data is being transmitted.
		Off	No data transmission.
LAN 1/2/3/4 (LAN 3/4 only on MC-1121)		Green	Steady On: 100 Mbps Ethernet link. Blinking: Data is being transmitted.
		Yellow	Steady On: 1000 Mbps Ethernet link. Blinking: Data is being transmitted.
		Off	10 Mbps Ethernet link or LAN is not connected.
Tx 1/2 (only on MC-1121)		Green	Blinking: Data is being transmitted.
		Off	Not connected.
Rx 1/2 (only on MC-1121)		Yellow	Blinking: Data is being transmitted.
		Off	Not connected.

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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-1100**

❒ **Wiring Requirements**
  ➢ Connecting the Power
  ➢ Grounding the Unit
  ➢ Connecting to the Network
  ➢ Connecting to a Serial Device
  ➢ Installing an SDHC/SDXC Card

❒ **Connecting to a USB Device**

❒ **DI/DO**

❒ **RTC Battery Replacement**

Installing the MC-1100

DIN-Rail Mounting

The MC-1100 comes with a DIN-rail mounting kit for installing the computer on a DIN rail.

Use 4 screws to tightly attach the DIN-rail mounting bracket to the MC-1100's rear panel.

Installation:

STEP 1:

Secure the DIN-rail kit to MC-1100.
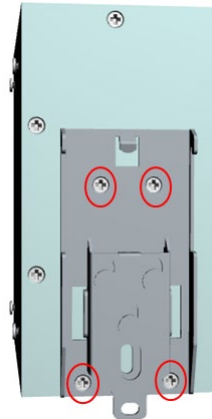
STEP 2:

Insert the upper lip of the DIN rail into the DIN-rail mounting kit.

STEP 3:

Press the MC-1100 towards the DIN rail until it snaps into place.
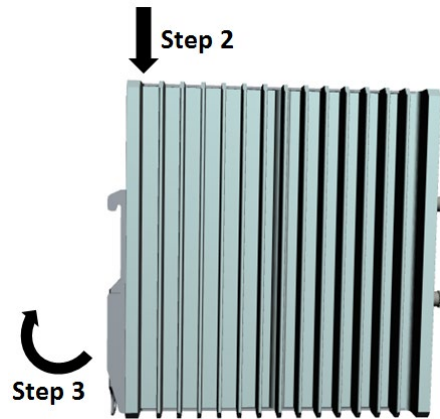
Removal:

STEP 1:

Pull down the latch on the mounting kit with a screwdriver.

STEPS 2 & 3:

Slightly pull the MC-1100 forward and lift up to remove it from the DIN-rail.
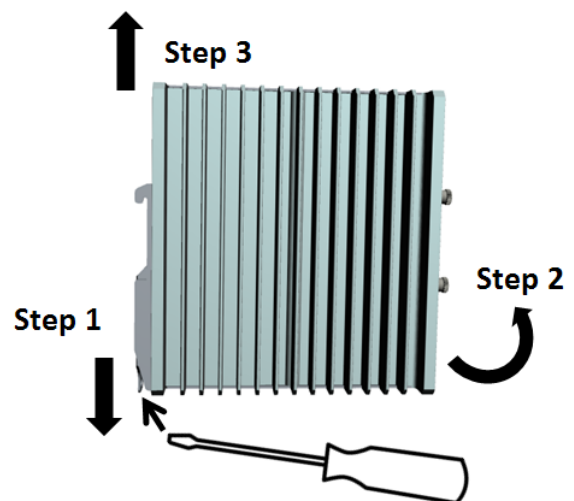
Wall or Cabinet Mounting

Use the optional wall-mounting kit to install the MC-1100 on a wall. This wall mounting kit must be purchased separately.

STEP 1:
Use two screws for each bracket to attach the brackets to the rear of the MC-1100.
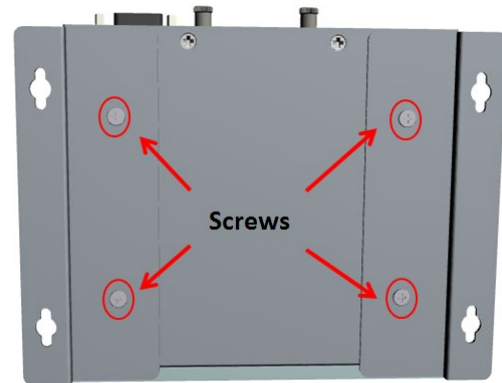
STEP 2:
Use four screws per side to attach the MC-1100 to a wall or cabinet.
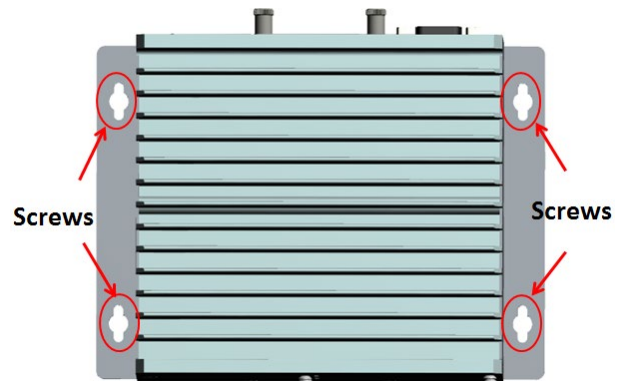
Wiring Requirements

In this section, we describe how to connect serial devices to the MC-1100 embedded computer.

Be sure to 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-1100.

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

Power Input
DC 12-36 V

V-

V+
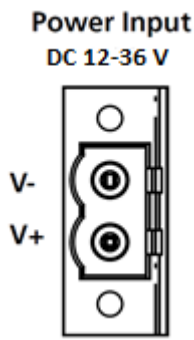
To power on the MC-1100, connect the "terminal block to power jack converter" to the MC-1100's DC terminal block (located on the left side panel), and then connect the power adapter. The system is automatically turned on by default when the power is plugged in. If it doesn't turn on automatically, press the Power Button to turn on the computer. Note that the Shielded Ground wire should be connected to the top pin of the terminal block. It takes about 30 seconds for the system to boot up. Once the system is ready, the Power LED will light up.

Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the grounding screw (M4) to the grounding surface prior to connecting the power.

MC-1111
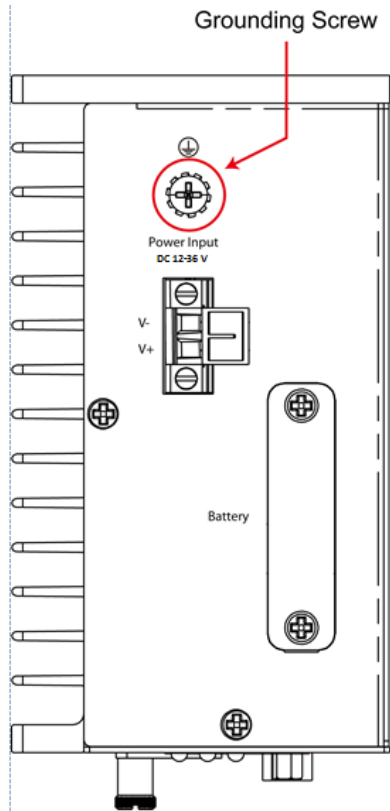
MC-1121
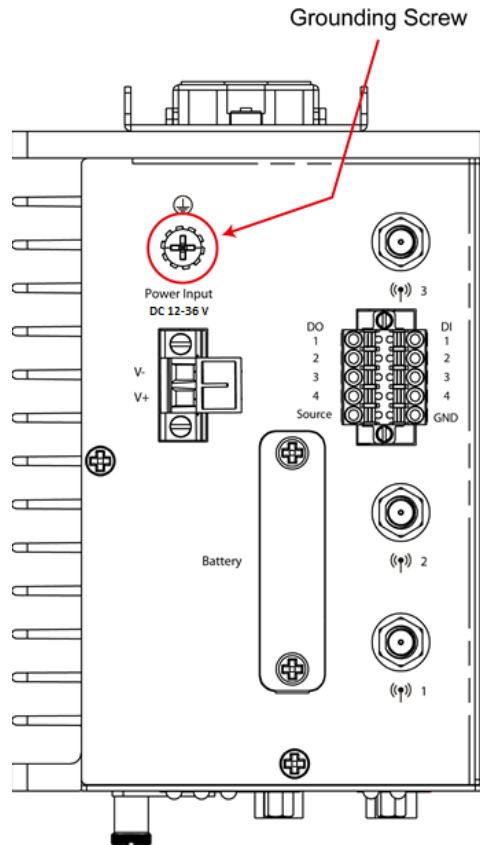
Connecting to the Network

Connect your network cable to the embedded computer's Ethernet port. The other end of the cable should be connected to your Ethernet network. When the cable is properly connected, the LEDs on the embedded computer's Ethernet port turns on to indicate a valid connection.

Two 10/100/1000 Mbps Ethernet ports using RJ45 connectors are located on the front panel of the embedded computer. See the following figure for the location of the Ethernet ports and the pin assignments.

NOTE   The pin assignments for the MC-1100 computer's Ethernet port are shown in the following figure. If you create your own Ethernet cable, make sure that you match the pin assignments on the connector of the Ethernet cable.
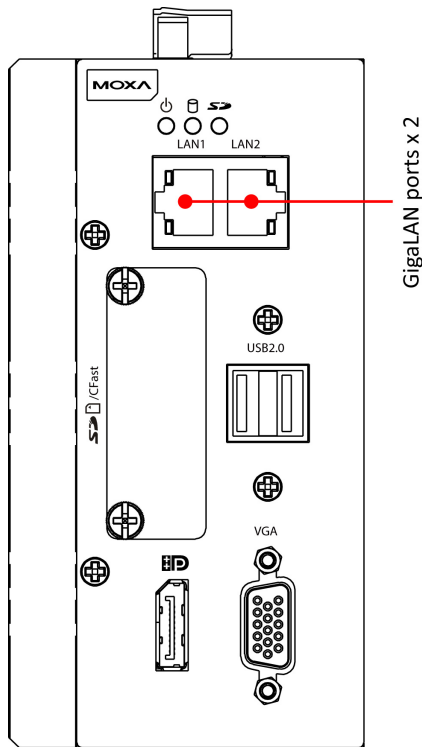
MC-1111   **MC-1121**
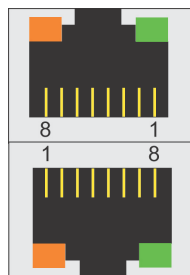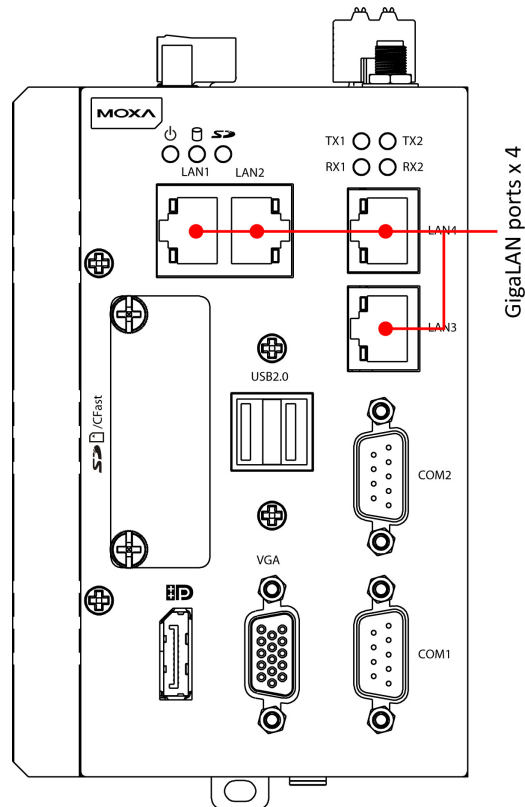
Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	ERx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

Connecting to a Serial Device

Use a serial cable to connect your serial device to the embedded computer's serial port. Serial ports P1 to P2 have male DB9 connectors and can be configured for RS-232, RS-422, or RS-485 communication (refer to the software manual for your operating system version). The pin assignments are shown in the following table:

MC-1121
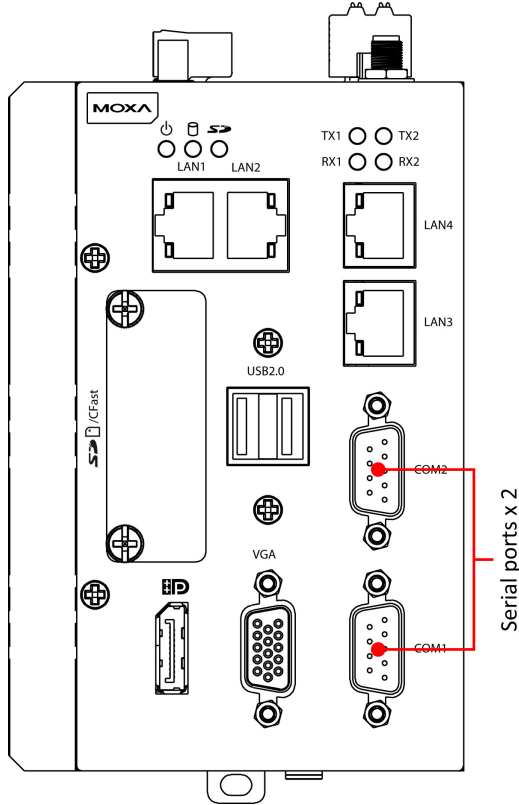
DB9 Male Port
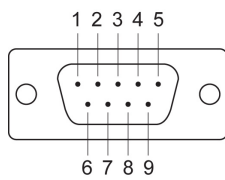
RS-232/422/485 Pinouts

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	–	–	–

Installing an SDHC/SDXC Card

The MC-1100 has an SD slot for storage expansion. The SD slot allows users to plug in a Secure Digital (SD) memory card compliant with the SD 3.0 standard. The following steps show how to install the SD card.

1. Disconnect the MC-1100 from its power source.
2. The SD slot is located on the right side of the front panel. Loosen the screws on the SD/CFast card cover.

MC-1111
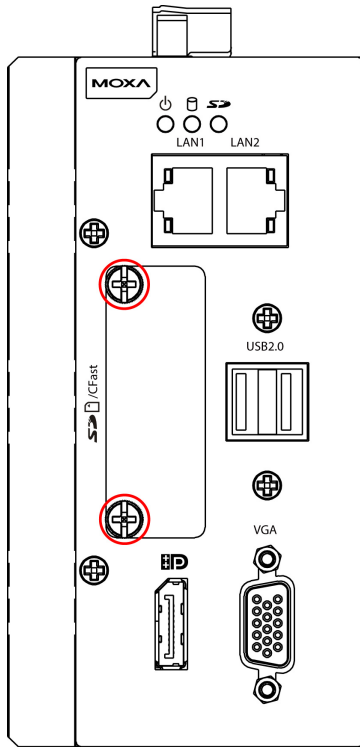
MC-1121
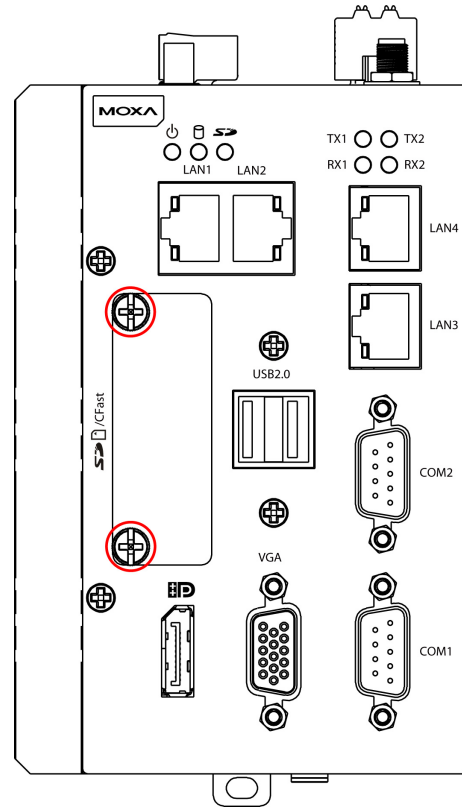
3. Press the SD card to eject it.
   When you want to insert it back into the SD slot, slide it into the slot and then push it in with your finger until it latches firmly.

ATTENTION

Be sure to properly orient the CFast card when installing it; otherwise, you may not be able to insert the card all the way into the slot.

4. After the SD card is installed correctly, fasten the screws on the SD/CFast card cover.

Connecting to a USB Device

The MC-1100 comes with one USB 3.0 host with type-A connector on the right side panel and two USB 2.0 hosts with type-A connectors on the front panel. These ports can be used for connecting to an external flash disk or hard drive for storing data. You can also use these USB ports to connect to a keyboard or a mouse.

The following figures show the locations of the USB ports.

MC-1111   **MC-1121**
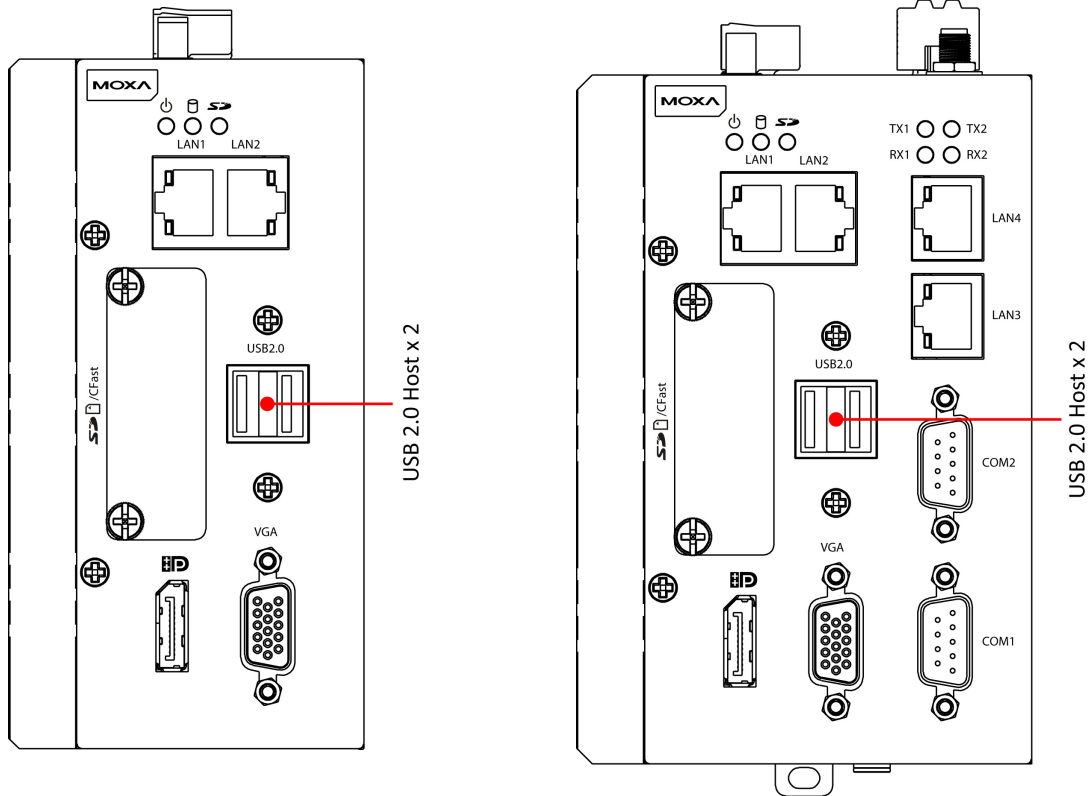
DI/DO

The MC-1121 comes with a 4-ch digital input and a 4-ch digital output that connect through a terminal block connector. The pin assignments and wiring methods are shown below:
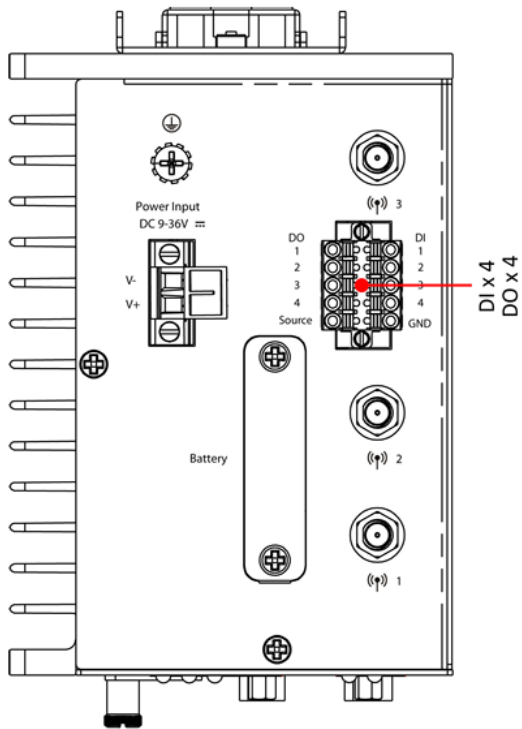
RTC Battery Replacement

The MC-1100's real-time clock is powered by a lithium battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.

⚠️ **ATTENTION**

There is a risk of explosion if the battery is replaced by an incorrect type of battery.

NOTE   The MC-1100 embedded computer can be customized to support an easy RTC battery replacement function. Please contact your Moxa sales representative for details.

4

BIOS Setup

In this chapter, we describe the BIOS settings for the MC-1100 embedded 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 are stored in the CMOS RAM, which has a backup battery power in case the computer is not connected to a power source. Consequently, the data stored in the CMOS RAM is retained when the system is rebooted or the power is disconnected.

The following topics are covered in this chapter:

❑ **Entering the BIOS Setup**

❑ **Main Information**

❑ **Advanced Settings**

  ➢ Boot Configuration

  ➢ PCI Express Configuration

  ➢ USB Configuration

  ➢ SD Configuration

  ➢ Miscellaneous Configuration

  ➢ SATA Configuration

  ➢ Console Redirection

  ➢ Hardware Monitor

  ➢ SMART RECOVERY Info

❑ **Security Settings**

  ➢ Set Supervisor Password

❑ **Power Settings**

  ➢ Wake on LAN

  ➢ Auto Wake on S5

❑ **Boot Settings**

  ➢ Boot Type

  ➢ PXE Boot to LAN

  ➢ PXE Boot capability

  ➢ Add Boot Options

  ➢ USB Boot

  ➢ Boot Delay Time

  ➢ Automatic Failover

  ➢ Boot Order Priority

  ➢ Legacy

❑ **EFI**

❑ **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

To enter the BIOS setup utility, press the **F2** key while the system is booting up. The main **BIOS Setup** screen appears with the following options:

- **Continue:** Continue to boot up
- **Boot Manager:** Select the device to boot up
- **Boot From File:** Select the UEFI boot up file
- **SCU:** Enter the BIOS configuration.

Click **SCU** to enter the **BIOS configuration**.

```
                                  Front Page
 Front Page

 Continue                                        This selection will direct the system to
 ▶Boot Manager                                   continue to booting process
 ▶Boot From File
 ▶Setup Utility
```

```
 F1  Help                  UP    Select Item        Enter Select ▶ SubMenu
 ESC Exit                  DOWN  Select Item
```
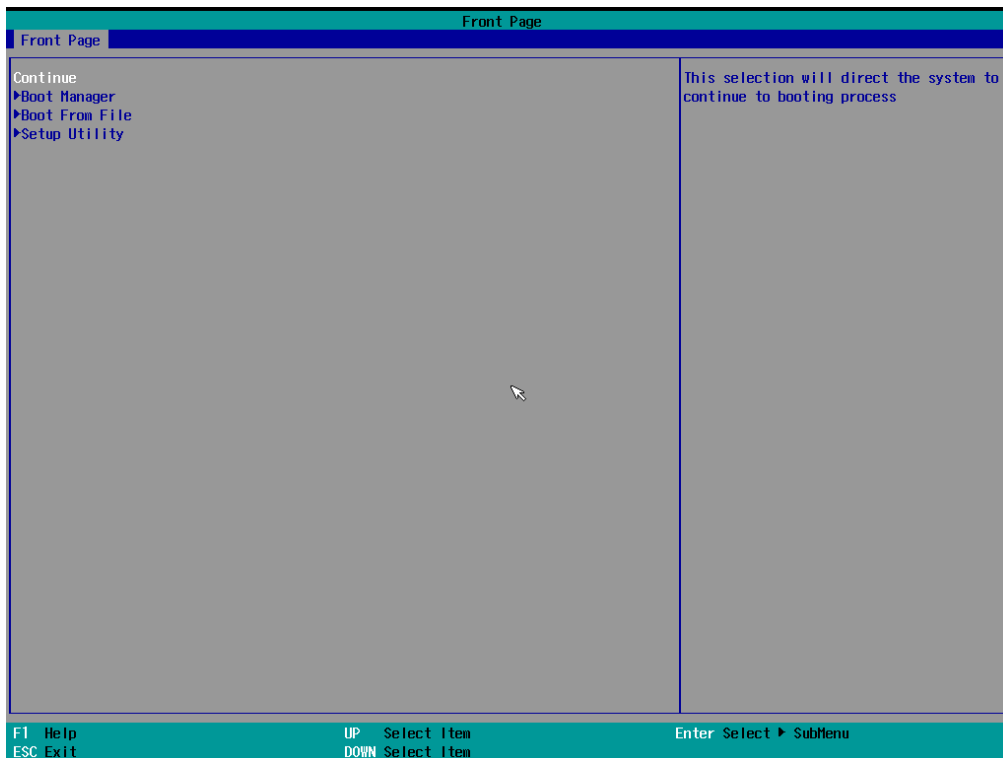
When you click **SCU**, a basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to use them.

F1: 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 shows basic system information, such as the model name, BIOS version, and CPU type.

NOTE The "Processor Type" varies depending on the product model.

```
                              InsydeH20 Setup Utility                        Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 BIOS Version                    V1.00S10                    This is the help for the hour, minute,
 Project Name                    V2201                       second field. Valid range is from 0 to
                                                             23, 0 to 59, 0 to 59. INCREASE/REDUCE : +
 Processor Type                  Intel(R) Atom(TM) CPU  E3845  @ 1.91GHz      /-.
 System Bus Speed                83 MHz
 System Memory Speed             1333 MHz
 Cache RAM                       2048 KB
 Total Memory                    4096 MB
 Channel A - SODIMM 0            4096 MB
 Channel B - SODIMM 0            [Not Installed]

 Platform firmware Information
 VLV SOC                         11 (DO Stepping)
 MRC Version                     1.43
 PUNIT FW                        0x25
 PMC FW Patch                    0x5_11
 TXE FW Version                  1.1.0.1113
 IGD VBIOS Version               3798
 Microcode Revision              903
 CPU Flavor                      VLV IVI (0)
 Board ID                        BALEY BAY (20)
 Fab ID                          FAB3 (03)

 System Time                     [01:26:16]
 System Date                     [01/06/2014]




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

Advanced Settings

The **Advanced** screen appears when you select "Advanced" from the main menu.

```
                              InsydeH20 Setup Utility                        Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

                                                             Configures Boot Settings.
 ▶Boot Configuration
 ▶PCI Express Configuration
 ▶USB Configuration
 ▶SD Configuration
 ▶Miscellaneous Configuration
 ▶SATA Configuration
 ▶Console Redirection
 ▶Hardware Monitor
 ▶SMART RECOVERY Info




 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 initial status of the Numlock key when the computer boots up.

Options: On (default), Off

```
                          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
```
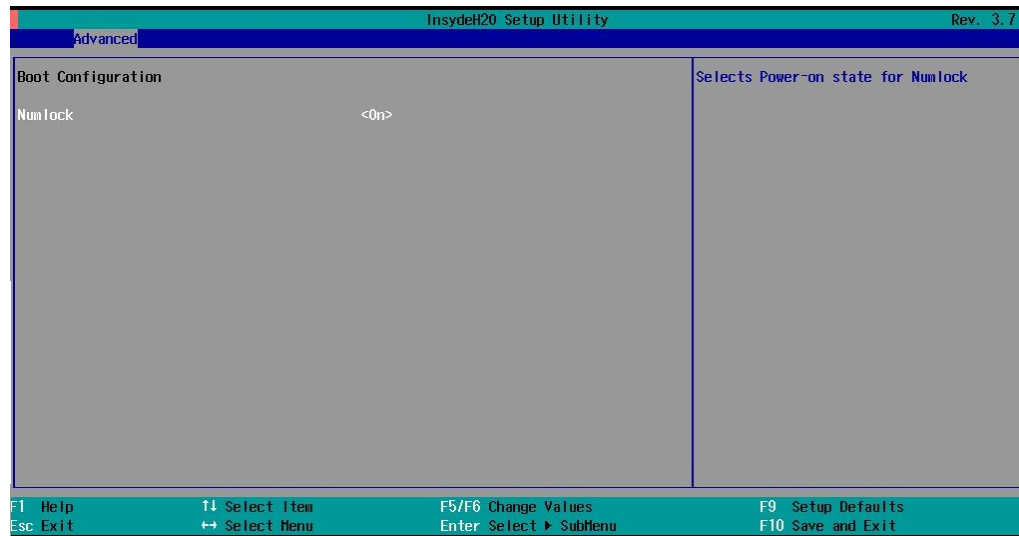
PCI Express Configuration

PCIE PORT 1 Speed

Configure PCIe Port1 Speed

Options: Auto, Gen1 and Gen2

PCIE PORT 2 Speed

Configure PCIe Port2 Speed

Options: Auto, Gen1 and Gen2

PCIE PORT 3 Speed

Configure PCIe Port3 Speed

Options: Auto, Gen1 and Gen2

PCIE PORT 4Speed

Configure PCIe Port4 Speed

Options: Auto, Gen1 and Gen2

USB Configuration

```
                          InsydeH20 Setup Utility                        Rev. 5.0
      Advanced

USB Configuration                                        Disable USB port

USB Port #0                    <Enabled>
USB Port #1                    <Enabled>
USB Port #2                    <Enabled>

















F1  Help           UP   Select Item    LEFT  Select Item   F5 Change Values   Enter Select ▶     F10 Save and Exit
ESC Exit           DOWN Select Item     RIGHT Select Item   F6 Change Values   F9    Setup Defaults
```
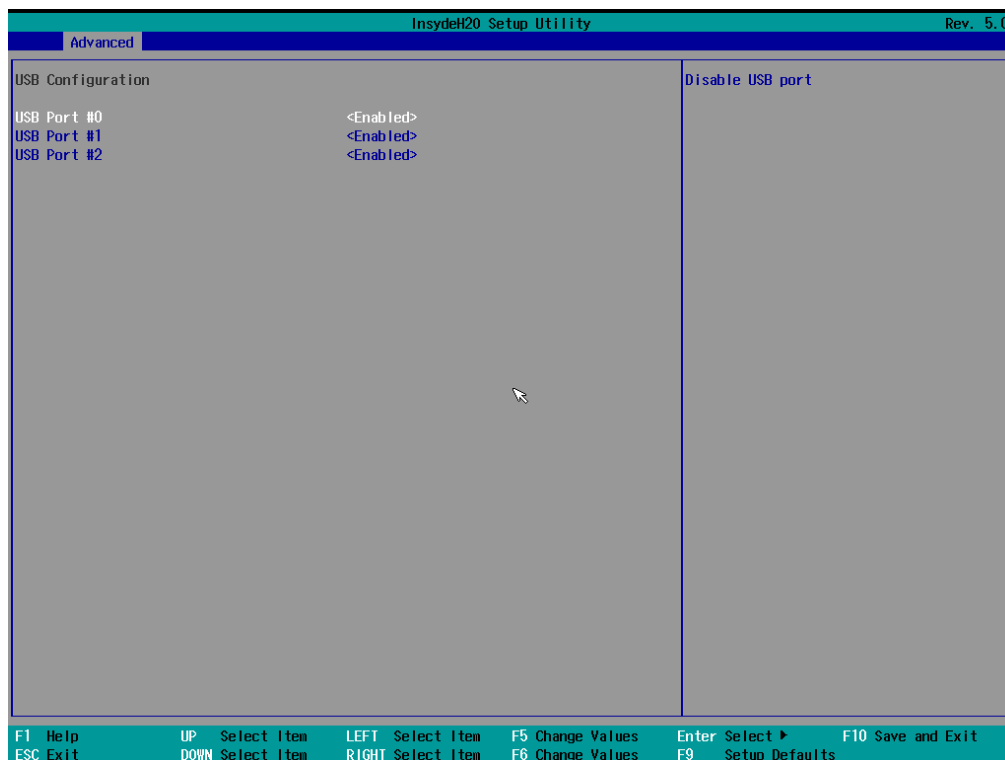
USB Port #0

Enable or Disable USB port 0; if disabled, the system won't detect when a USB device is plugged in.

Option: Enabled (default), Disabled

USB Port #1

Enable or Disable USB port 1; if disabled, the system won't detect when a USB device is plugged in.

Option: Enabled (default), Disabled

USB Port #2

Enable or Disable USB port 2; if disabled, the system won't detect when a USB device is plugged in.

Option: Enabled (default), Disabled

USB Port #3

Enable or Disable USB port 3; if disabled, the system won't detect when a USB device is plugged in.

Option: Enabled (default), Disabled

SD Configuration

```
                              InsydeH20 Setup Utility                       Rev. 5.0
    Advanced
 SD Configuration                                            Disable/Enable SDR25 Capability in SD
                                                             Card controller
 SDR25 Capability Support for SDCard      <Enabled>
 DDR50 Capability Support for SDCard      <Disabled>




















 F1  Help              ↑↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
 Esc Exit              ↔ Select Menu       Enter Select ▶ SubMenu    F10 Save and Exit
```
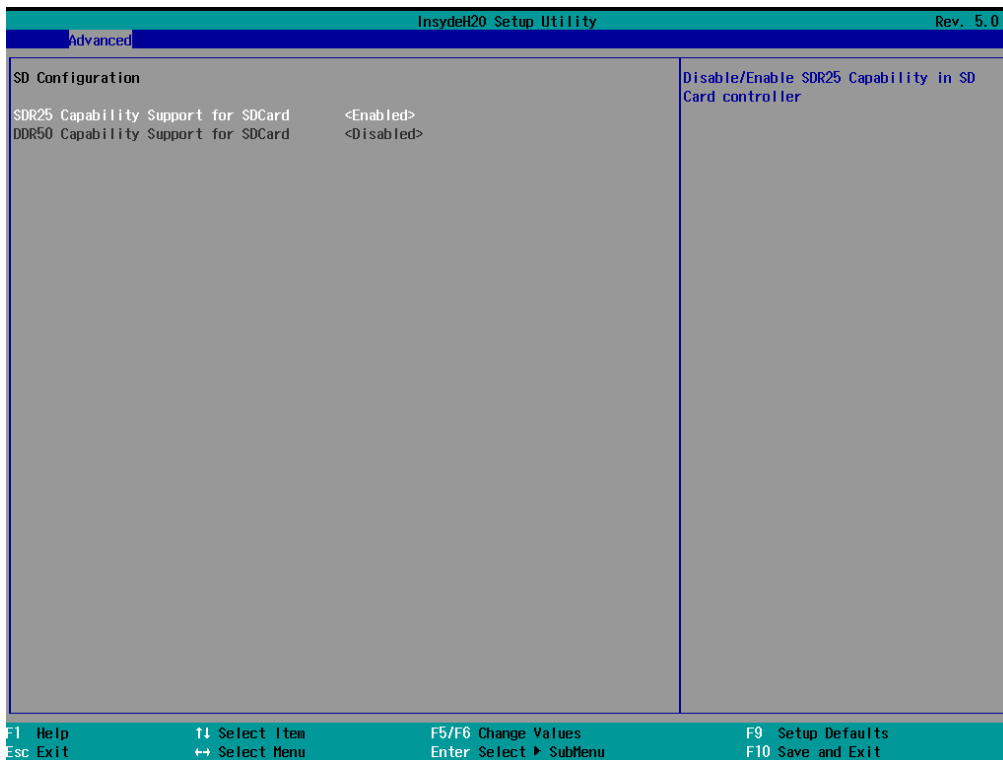
SDR25 Capability Support for SD Card

Set Input/output timing for SDR25 mode.

Option: Enabled (default), Disabled

DDR50 Capability Support for SD Card

Set Input/output timing for DDR50 mode.

Option: Enabled (default), Disabled

Miscellaneous Configuration

```
                          InsydeH20 Setup Utility                          Rev. 5.0
     Advanced
Miscellaneous Configuration                              Specify what state to go to when power is
                                                         re-applied after a power failure (G3
Power ON after Power Failure          <Enable>           state).













F1  Help          UP   Select Item   LEFT  Select Item  F5 Change Values  Enter Select ▶    F10 Save and Exit
ESC Exit          DOWN Select Item   RIGHT Select Item   F6 Change Values  F9   Setup Defaults
```
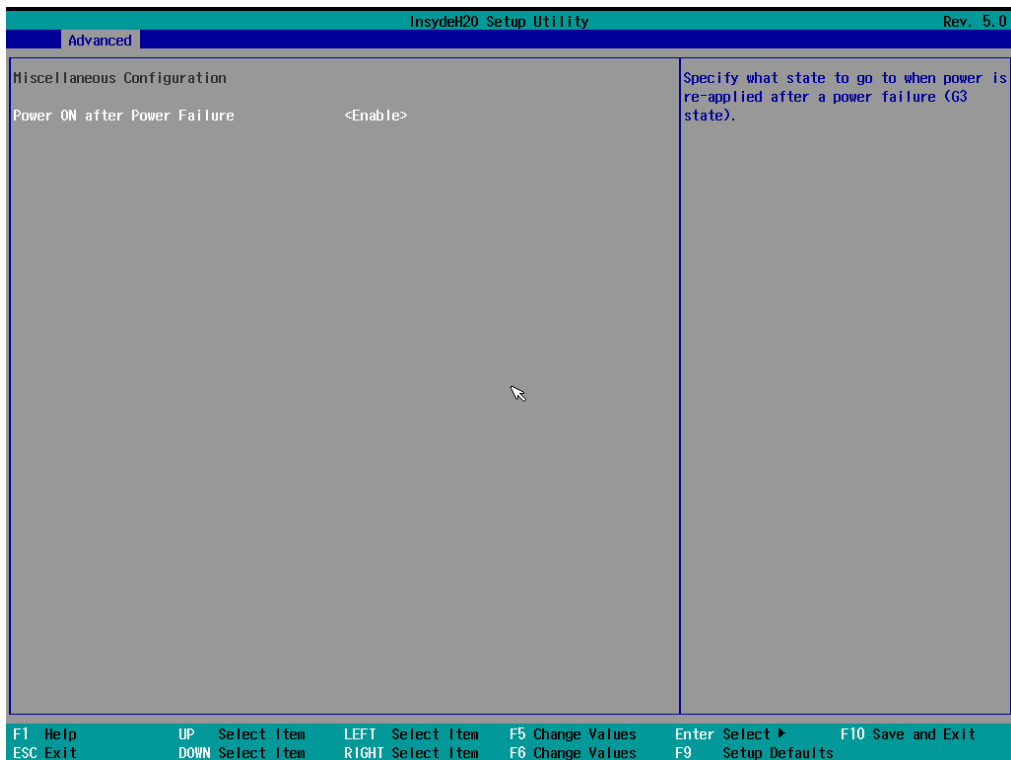
Power ON after Power Failure

This setting allows you to configure whether or not the computer automatically reboot after a system crash. When set to ON, the computer will automatically reboot after a system crash; when set to OFF, it won't automatically reboot after a system crash. Options: ON (default), OFF, Last State.

DO-0 Level

This item allows you set the DO 0 as high or low.

Options: High (default), Low

DO-1 Level

This item allows you set the DO 1 as high or low.

Options: High (default), Low

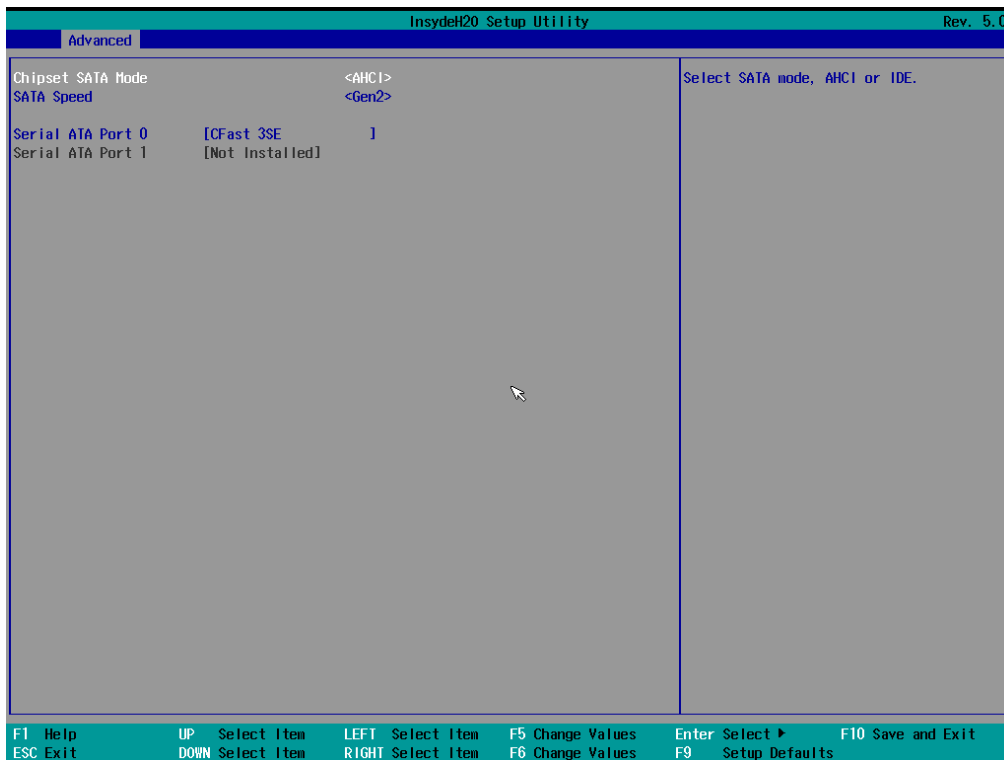## DO-2 Level

This item allows you set the DO 2 as high or low

Options: High (default), Low

DO-3 Level

This item allows you set the DO 3 as high or low.

Options: High (default), Low

SATA Configuration

```
                              InsydeH20 Setup Utility                            Rev. 5.0
      Advanced
 Chipset SATA Mode                    <AHCI>                    Select SATA mode, AHCI or IDE.
 SATA Speed                           <Gen2>

 Serial ATA Port 0    [CFast 3SE       ]
 Serial ATA Port 1    [Not Installed]




                                       ↖




 F1  Help          UP   Select Item   LEFT  Select Item  F5 Change Values   Enter Select ▶    F10 Save and Exit
 ESC Exit          DOWN Select Item   RIGHT Select Item  F6 Change Values   F9   Setup Defaults
```

Chipset SATA Mode

Select SATA mode
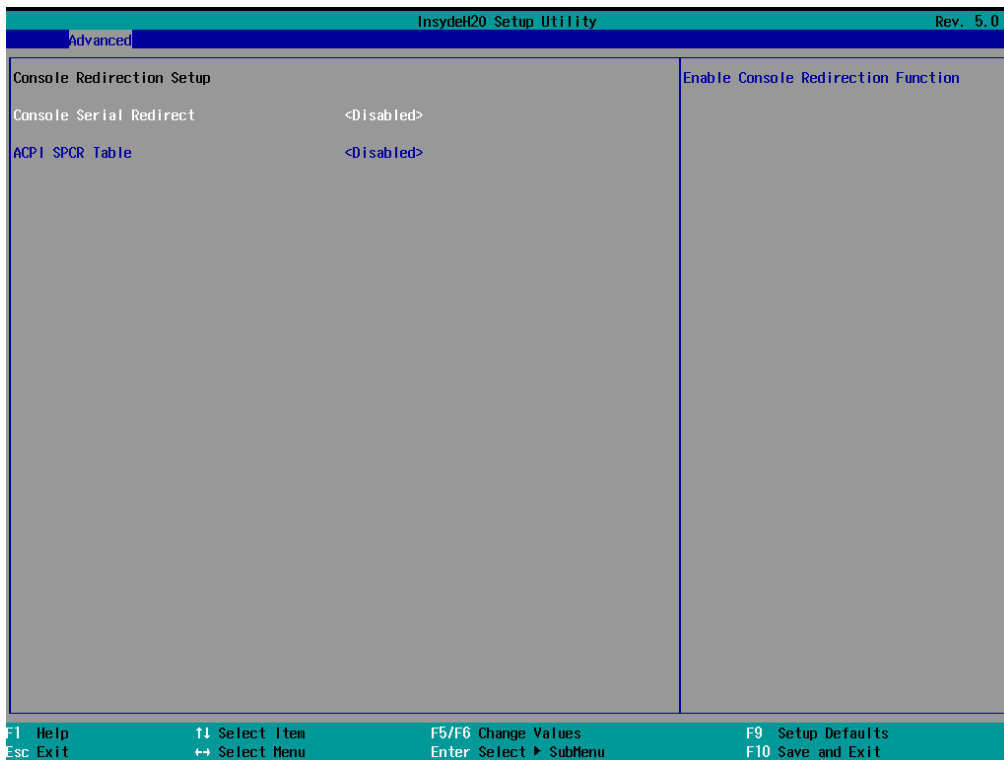
Options: AHCI (default), IDE

SATA Speed

Select SATA Speed

Options: Gen1 (default), Gen2

Console Redirection

```
                              InsydeH20 Setup Utility                              Rev. 5.0
    Advanced
 Console Redirection Setup                                    Enable Console Redirection Function

 Console Serial Redirect              <Disabled>

 ACPI SPCR Table                      <Disabled>




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

Console Serial Redirect

When the Console Redirection Function is enabled, the console information will be output to both the HDMI monitor and through the serial port.
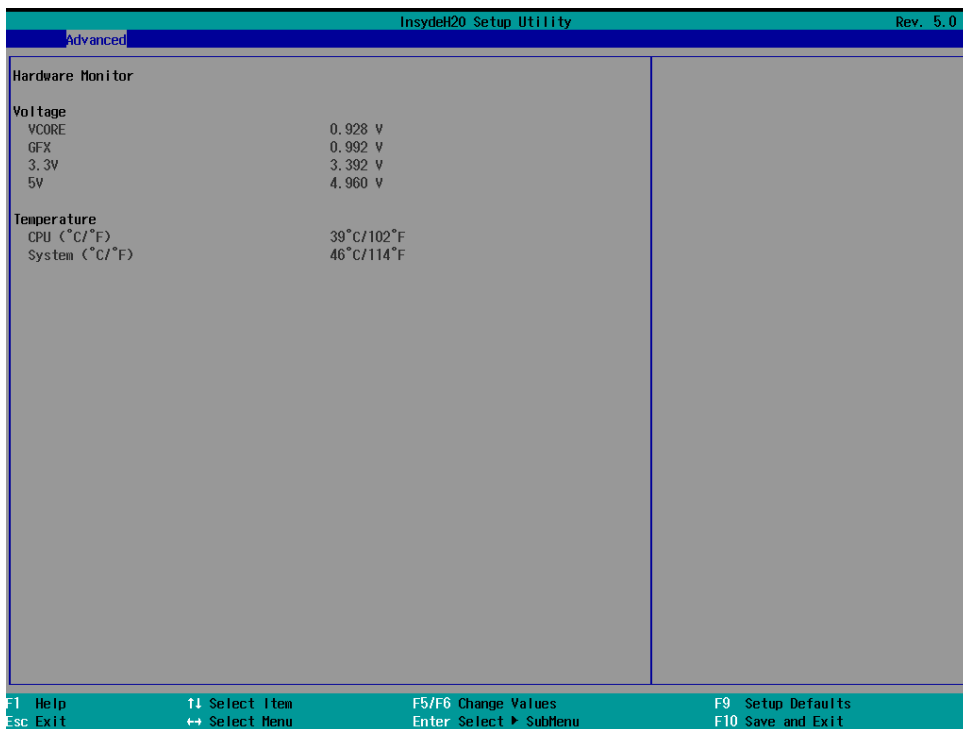
Options: Disabled (default), Enabled

ACPI SPCR Table

This table is used to indicate whether a serial port or a non-legacy UART (Universal Asynchronous Receiver/Transmitter) interface is available for use with Microsoft Windows Emergency Management Services (EMS).

Options: Disabled (default), Enabled
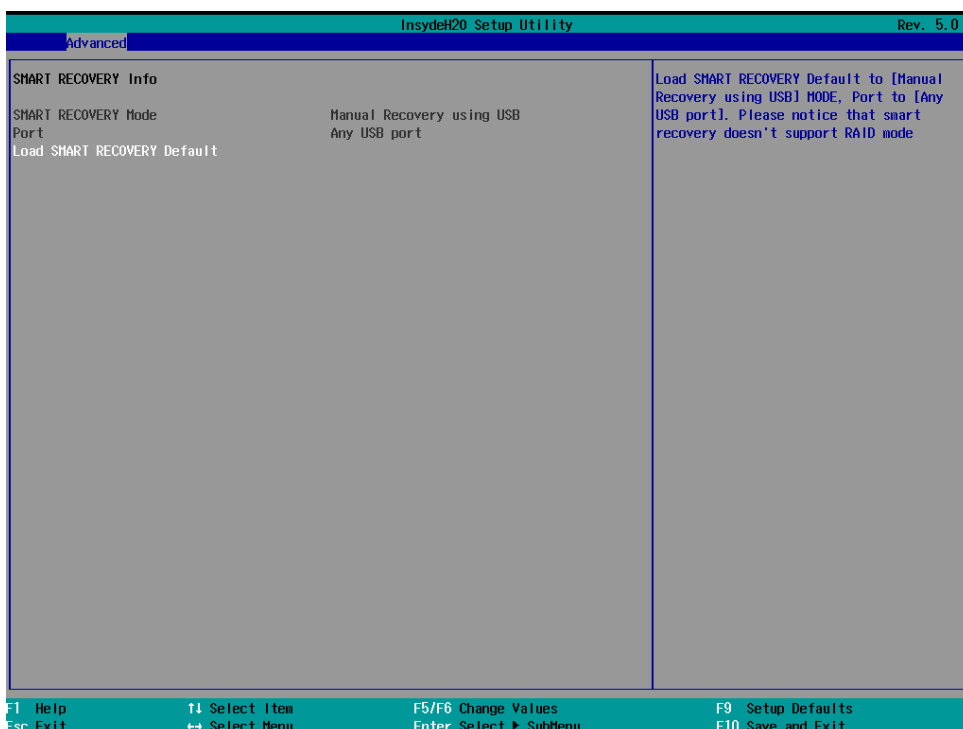
Hardware Monitor

This screen allows you to view voltage levels, system temperature, and CPU temperature.

```
                              InsydeH20 Setup Utility                        Rev. 5.0
        Advanced

Hardware Monitor

Voltage
  VCORE                           0.928 V
  GFX                             0.992 V
  3.3V                            3.392 V
  5V                              4.960 V

Temperature
  CPU (°C/°F)                     39°C/102°F
  System (°C/°F)                  46°C/114°F




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

Note that the voltage values vary depending on the model. The temperature readings shown on the screen are within ±5% of the actual readings. However, the temperature readings are only valid when the ambient temperature is above 0°C.

SMART RECOVERY Info

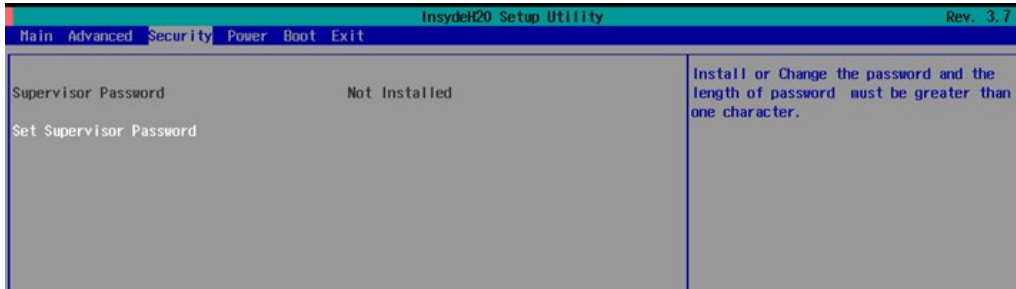This screen allows you to view Smart Recovery information.

```
                              InsydeH20 Setup Utility                        Rev. 5.0
        Advanced

SMART RECOVERY Info                                           Load SMART RECOVERY Default to [Manual
                                                             Recovery using USB] MODE, Port to [Any
SMART RECOVERY Mode            Manual Recovery using USB      USB port]. Please notice that smart
Port                          Any USB port                   recovery doesn't support RAID mode
Load SMART RECOVERY Default




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

Load SMART RECOVERY Default

This setting allows you to load the Smart Recovery default value. Refer to the Smart Recovery Website at http://www.moxa.com/product/Smart-Recovery.htm for details

Options: Yes (default), No

Security Settings

This screen allows you to configure a supervisor 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
```
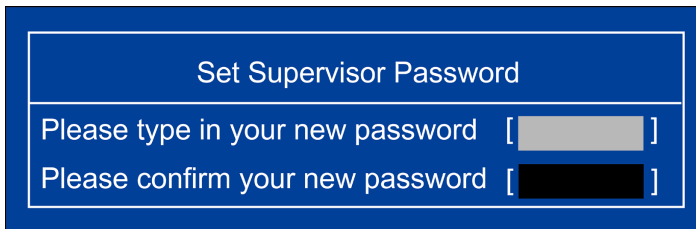
Set Supervisor Password

This setting allows you set the supervisor password.

Type the new password, and then retype the password again to confirm.

To delete the password, enter the existing password in the **Set Supervisor Password** field and leave the new password fields blank; then, press [Enter].

```
┌─────────────────────────────────────────────────────┐
│              Set Supervisor Password                 │
├─────────────────────────────────────────────────────┤
│  Please type in your new password   [            ]   │
│  Please confirm your new password  [          ]      │
└─────────────────────────────────────────────────────┘
```

Power Settings

The screen allows you to configure power settings.

```
                          InsydeH20 Setup Utility                          Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 Wake on LAN                        <Enabled>          This feature is used to wake the system
 Auto Wake on S5                    <Disabled>         by a LAN device from a remote host.
 Power State 2 for VCC & VNN        <Disable>          Options: Enabled (default), Disabled




















 F1  Help            UP   Select Item   LEFT  Select Item   F5 Change Values   Enter Select ▶      F10 Save and Exit
 ESC Exit            DOWN Select Item   RIGHT Select Item   F6 Change Values   F9   Setup Defaults
```

Wake on LAN

This setting allows you to wake the system over the LAN from a remote host.

Options: Enabled (default), Disabled.

Auto Wake on S5

This setting allows you to configure the computer to wake from the S5 (Soft Off) state where the power supply remains engaged but is not supplying power to all other parts of the system.

You can set the auto-wake on S5 schedules for the system to perform a soft-reboot at specific times.

Options: Disabled (default); By Every Day (user specifies at what time each day the computer will power up); By Day of Month (user specifies which day of each month the computer will power up)

```
                              InsydeH20 Setup Utility                              Rev. 5.0
   Main  Advanced  Security  Power  Boot  Exit

 Wake on LAN                      <Enabled>                  This feature is used to wake the system
 Auto Wake on S5                  <Disabled>                 by a LAN device from a remote host.
                                                             Options: Enabled (default), Disabled












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

```
                              InsydeH20 Setup Utility                              Rev. 5.0
   Main  Advanced  Security  Power  Boot  Exit

 Wake on LAN                      <Enabled>                  Wake on RTC from S5 state, By Day of
 Auto Wake on S5                  <By Day of Month>          Month or Fixed time of every day
   Wake on S5 Time                [00:00:00]
   Day of Month                   [1]












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

Boot Settings

The screen allows you to configure boot settings.

```
                              InsydeH20 Setup Utility                              Rev. 5.0
   Main  Advanced  Security  Power  Boot  Exit

                                                            Select boot type to Dual type, Legacy
                                                            type or UEFI type
   Boot Type                        <Dual Boot Type>
   PXE Boot to LAN                  <Disabled>
   PXE Boot capability              <Disabled>
   Add Boot Options                 <Last>
   USB Boot                         <Enabled>
   Boot Delay Time                  [0]
   Automatic Failover               <Enabled>

   Boot Order Priority              <Legacy First>
   ▶Legacy
   ▶EFI




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

Boot Type

The system will be based on the value used to build the boot environment for different types of operating systems.

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

PXE Boot to LAN

This setting allows you to enable or disable the PXE boot to LAN function.

Options: Disabled (default), Enabled

PXE Boot capability

This function is enabled while PXE Boot to LAN enabled.

Supports Network Stack UEFI PXE or Legacy.

Options: Disabled (default), UEFI: IPv4, Legacy

Add Boot Options

This setting allows you to add boot order options for new boot devices and removable devices, such as a USB drive.

Options: Last (default), First, Auto

USB Boot

This setting allows you to enable or disable the USB boot function.

Options: Enabled (default), Disabled

Boot Delay Time

This setting allows you to configure the delay time to enter a hot key during POST.

Options: 0 Second (default), User define

Automatic Failover

Options: Enabled (default), Disabled

Enable: If boot to default device fails, it will try to boot the next device.

Disable: If boot to default device fails, a warning message will pop up.

Boot Order Priority

This setting allows you to determine the booting priority of the EFI device. If this setting is EFI first, the EFI device will boot first; if Legacy first, the legacy device will boot first.

Options: Legacy first (default), EFI first

Legacy

Normal Boot Menu

This setting allows you to configure the boot menu.

Options: Normal (default), Advance

Boot Type Order

This setting allows you to configure the boot order. To change the boot order, press the "-" or "F5" key to an item move down the list, and the "+" or "F6" key to move up.

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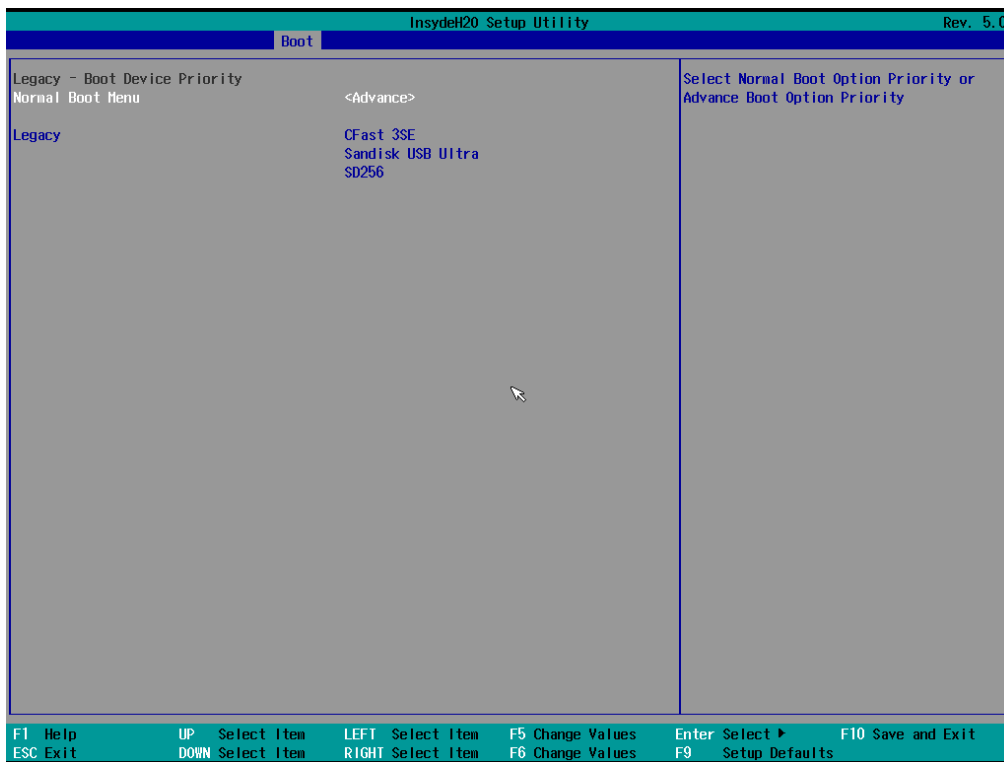
EFI

Adjust boot order settings for an EFI device.

Exit Settings

The screen shows the various options to exit from the BIOS setup utility.
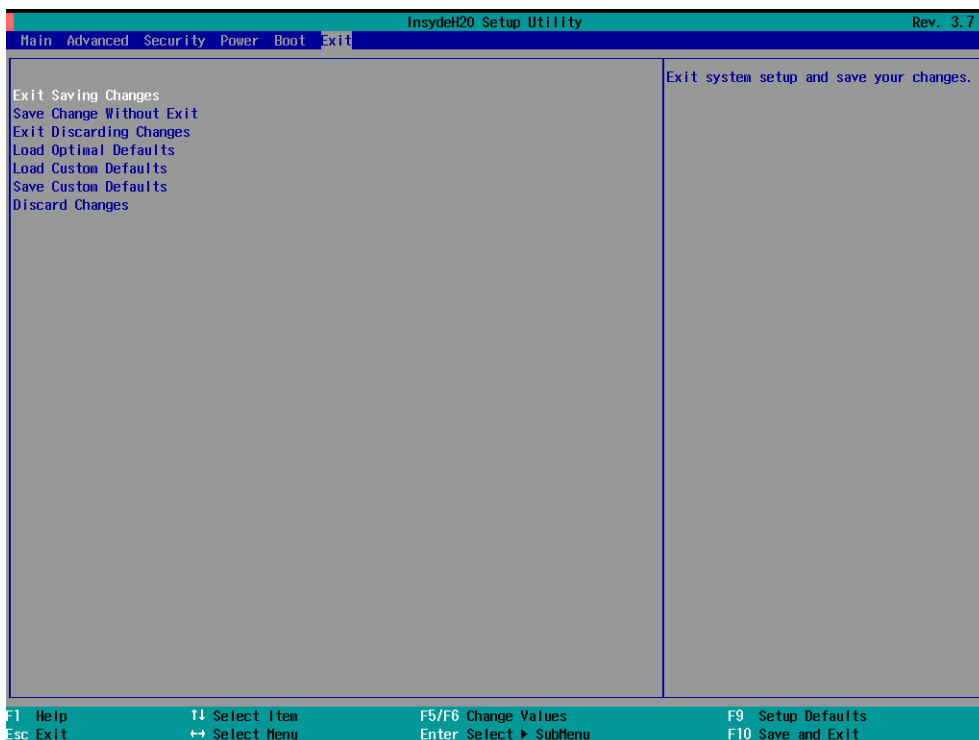
Exit Saving Changes

This option allows you to exit the BIOS setup utility and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

This option allows you to save changes without exiting the BIOS setup utility.

Options: Yes (default), No

Exit Discarding Changes

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

Options: Yes (default), No

Load Optimal Defaults

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

Options: Yes (default), No

Load Custom Defaults

This option allows you to load the custom default BIOS settings.

Options: Yes (default), No

Save Custom Defaults

This option allows you to save the current BIOS settings as a "custom default" that you can load at any time using the "Load Custom Defaults" option.

Options: Yes (default), No

Discard Changes

This option 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.

> ⚠️ **WARNING**
>
> An improper BIOS upgrade process may permanently damage the computer. We strongly recommend that you contact Moxa technical support for assistance to obtain all the necessary tools and the most up-to-date 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 drive as a system rescue device.

A useful software suite for creating USB RAM drives can be found by searching for Rufus, which can then be downloaded and used to create a bootable RAM drive.

Complete the following steps to create a bootable USB disk using Rufus:

1. Start Rufus* and then in the "Device" drop-down list select the USB device that you want to use as a bootable disk.
   *Rufus official website:
   https://rufus.akeo.ie/?locale=en_US

2. Select **MBR partition scheme for BIOS or UEFI computers** from the "Partition scheme and target system type" drop-down list so it can boot from a legacy BIOS or UEFI.

3. Select **FAT32 (Default)** from the "File system" drop-down list.

4. Select **4096 bytes (Default)** from the "Cluster size" drop-down list.

5. Enter a drive name in the "New volume label" input box.

6. Select the **Quick format**, **Create a bootable disk using FreeDOS**, and **Create extended label and icon files** options.

7. Click **Start** to format and create the bootable USB drive.
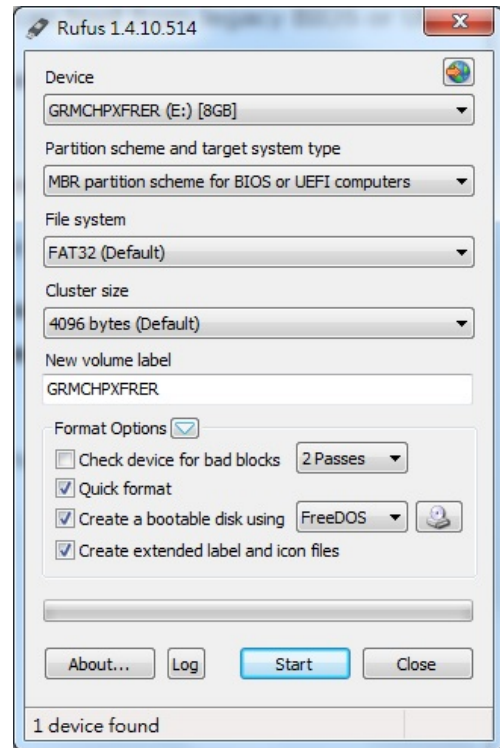
> ⚠️ **ATTENTION**
>
> When you use a USB drive larger than 4 GB, you will need to convert the file system type to FAT32.

Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa technical support for assistance.

1. Get the BIOS upgrade installation file.
   The file name should be in the format: **MC-1100_VxxxSxx.exe** (where "xx" refers to the version numbers).
2. Copy the file to the bootable USB drive.

Step 3: Run the Upgrade Program on the MC-1100 Computer

1. Reboot the computer, and press F2 during the booting process to display the Boot Manager.

```
                              Front Page
 Front Page

Continue                                              This selection will direct the system to
▶Boot Manager                                         continue to booting process
▶Boot From File
▶Setup Utility
```

```
 F1  Help                    UP    Select Item         Enter Select ▶ SubMenu
 ESC Exit                    DOWN  Select Item
```
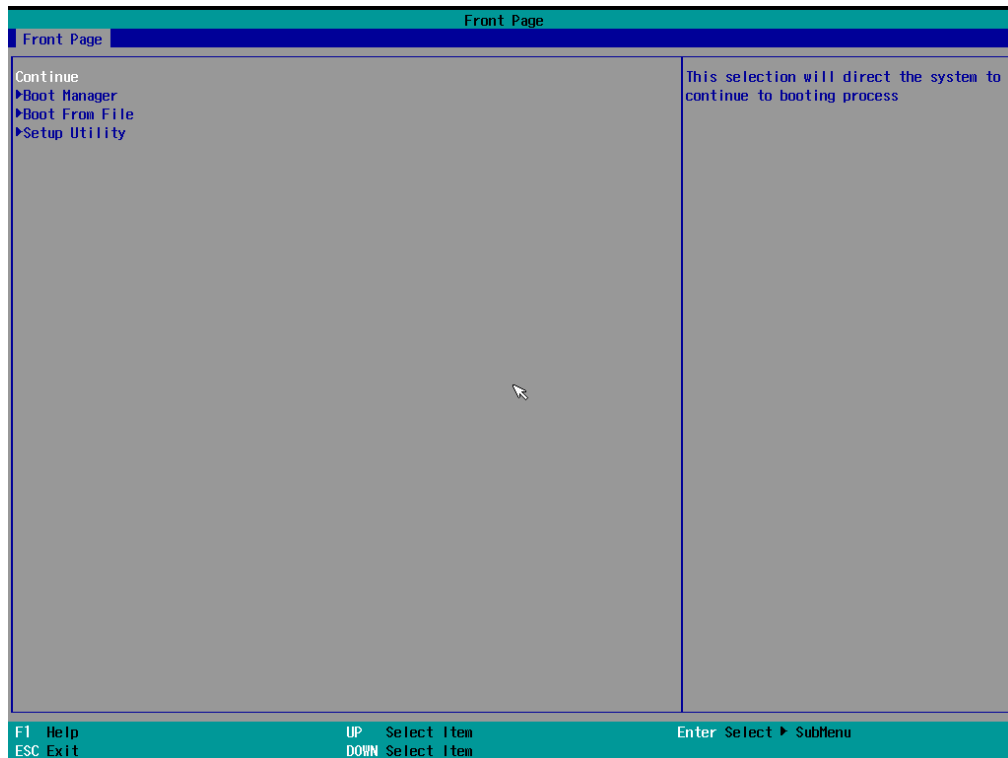
2. Select USB Disk as the first boot source and press [Enter] to continue.

```
                              Boot Manager


Boot Option Menu

Legacy Hard Drive
CFast 3SE
Legacy USB
Sandisk USB Ultra
Legacy Floppy
SD256
EFI Boot Devices
Internal EFI Shell

↑ and ↓ to change option, ENTER to select an option, ESC to exit
```

```
 F1  Help                    UP    Select Item         Enter Select ▶ SubMenu
 ESC Exit                    DOWN  Select Item
```

3. When the computer finishes booting up, a command window appears. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the MC-1100 folder, type `cd MC-1100`.

```
C:\cd MC-1100
```

4. Run the upgrade program by typing **MC-1100S10.exe**.

   Note that the filename for the upgrade program may vary depending on the version.

```
C:\ MC-1100>MC-1100S10.exe
```

5. The upgrade program will run automatically. Wait until the procedure is complete.

⚠️ **ATTENTION**

Do NOT remove the power supply during a BIOS upgrade.

```
C:\> MC-1100>MC-1100S10.exe
Option: -bios -all -nv



                    Please do not remove the AC power!


        Insyde H20FFT (Flash Firmware Tool) Version (SEG) 100.00.07.20
           Copyright(c) 2012 – 2014, Insyde Software Corp. All Rights
                                   Reserved.


                    Initializing


                    Current BIOS Model name: MC-1100
                    New     BIOS Model name: MC-1100


                    Current BIOS version: V1.00S10
                    New     BIOS version: V1.00S10


                    Updating Block at FFFFF000

   0%          25%          50%          75%          100%

                                                              100%
```

6. When the upgrade is finished, the computer automatically reboots. You may check the BIOS version on the Main page of the BIOS setup utility.

```
 BIOS Version               V1.00S10
 Project Name               MC-1100
```

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 or her own expense.

European Community

Warning:
This is a class A product. If used in a domestic environment, this product may cause undesirable radio interference, in which case the user may be required to take adequate measures to prevent the interference from affecting nearby devices.

B

Configuring the Serial Interface

In this chapter, we describe how to configure the MC-1100 embedded computer's serial interface.

The following topics are covered in this appendix:

❑ **Overview**
❑ **Configuring the Serial Interface Mode**

Overview

The MC-1100's COM1 and COM2 serial ports support the following serial modes: **RS-232**, **2-wire RS-485**, and **4-wire RS-422/485**.

Configuring the Serial Interface Mode

Complete the following steps to configure the serial interface mode:

1. From the Start menu, Click **All Programs → Moxa → mxSetSerialInterface**.
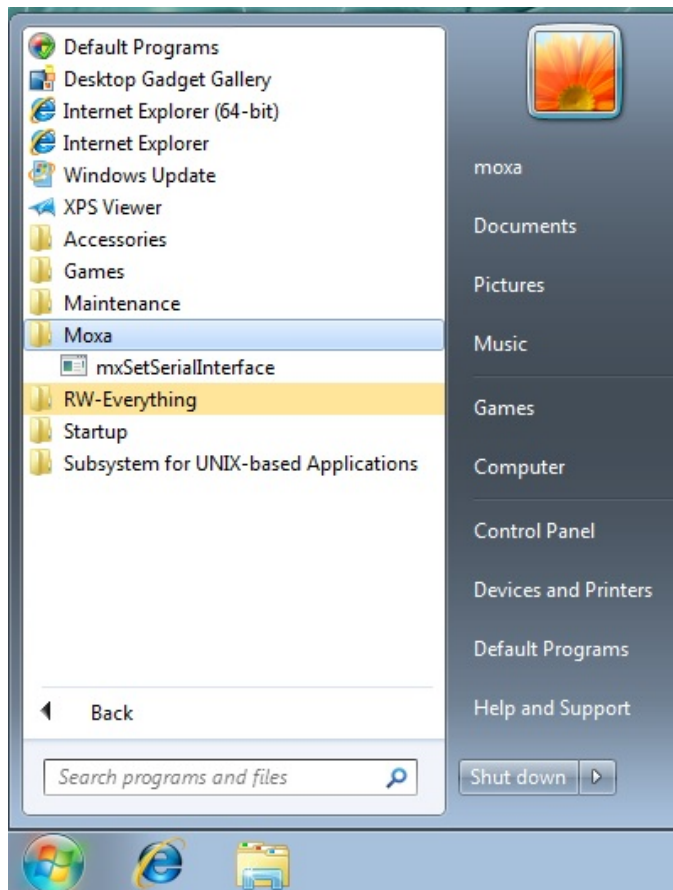
2. Select the port you would like to configure from the **Port** dropdown box.
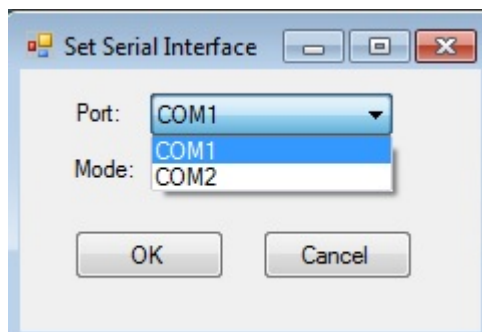
3. Select the serial interface mode for the port from the **Mode** dropdown box.
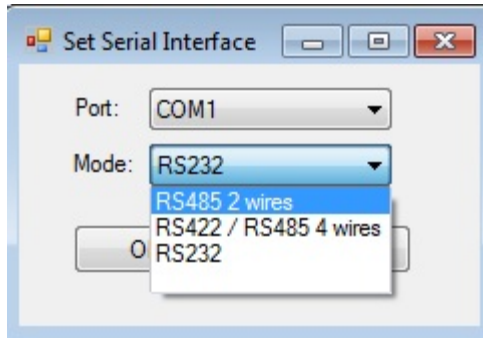
4. Click **OK**.
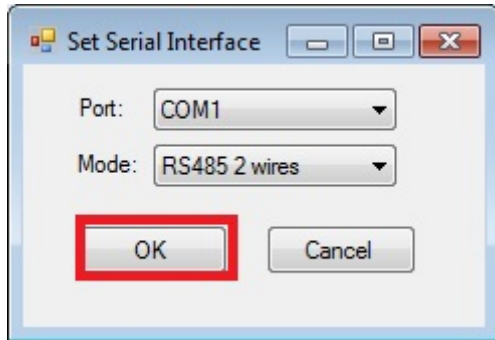
C

Examples
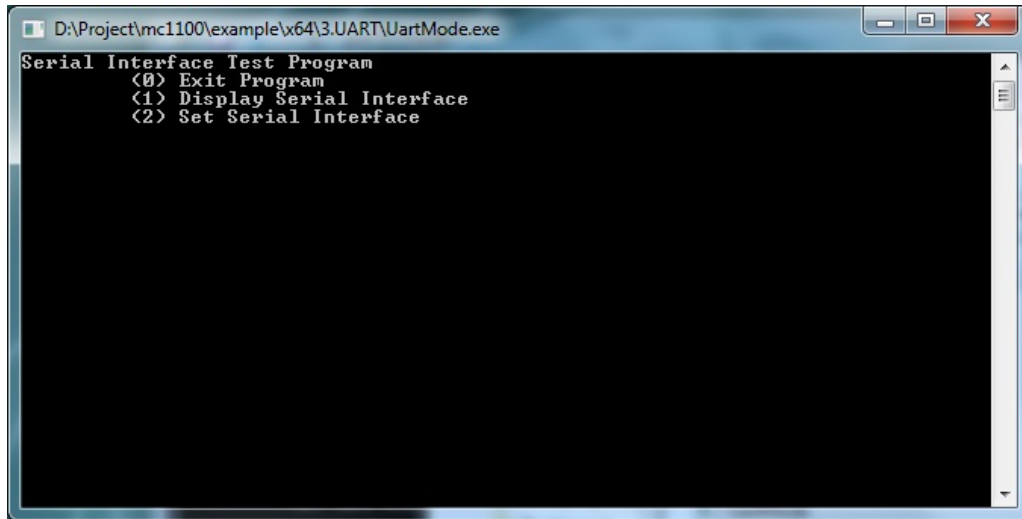
In this chapter, we provide examples to illustrate how to use the MC-1100 computer for a variety of applications.

The following topics are covered in this appendix:

❑ **Serial Interface**
❑ **Digital Input/Output**
❑ **Watchdog**
❑ **Power Control**
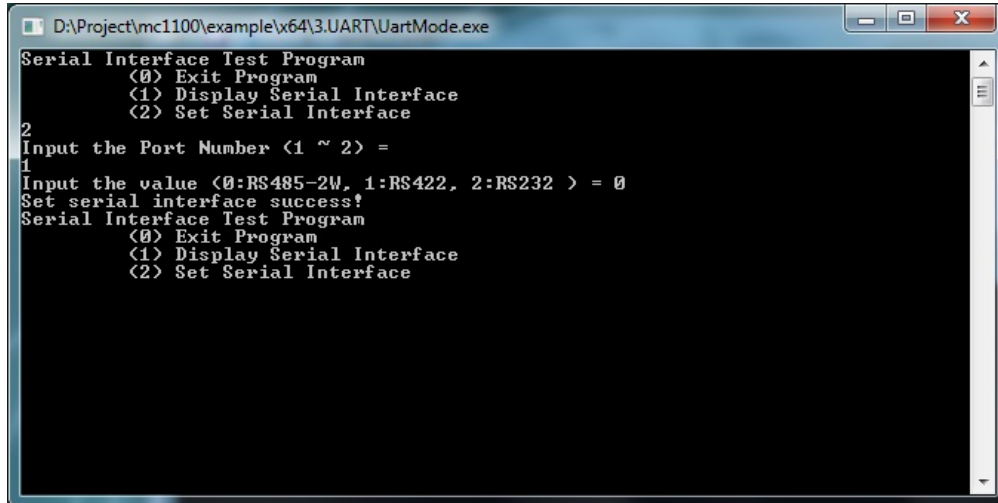
Serial Interface

1. Copy the following files from the software CD/DVD to a folder on the MC-1100.

   mxsp.dll: \examples\MC-1100-W7E-example\3.lib\mxsp\x64\

   sysinfo.dll: \examples\MC-1100-W7E-example\3.lib\mxsp\x64\

   sysinfo.sys: \examples\MC-1100-W7E-example\3.lib\mxsp\x64\

   sysinfoX64.sys: \examples\MC-1100-W7E-example\3.lib\mxsp\x64\

   mxGeneralIo.dll: \examples\MC-1100-W7E-example\3.lib\MxGeneralIo\x64\

   UartMode.exe: \examples\MC-1100-W7E-example\x64\Release\

2. Execute **UartMode.exe**.

3. Type **2** to set the serial interface, and then follow the onscreen instructions

4. Type **1** to display the current serial interface settings.

```
D:\Project\mc1100\example\x64\3.UART\UartMode.exe
Serial Interface Test Program
        (0) Exit Program
        (1) Display Serial Interface
        (2) Set Serial Interface
1
COM1 = RS485-2W
COM2 = RS232
Serial Interface Test Program
        (0) Exit Program
        (1) Display Serial Interface
        (2) Set Serial Interface
_
```
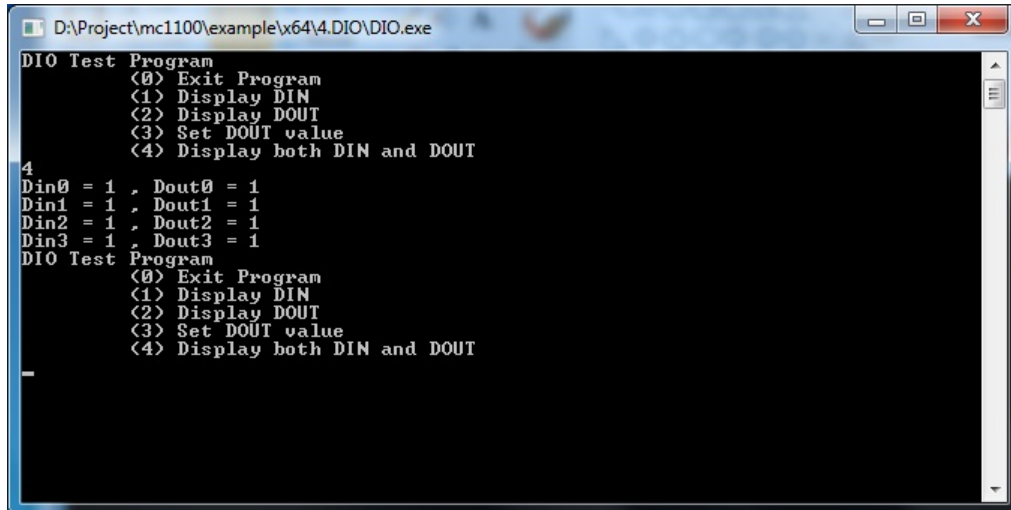
Digital Input/Output

1. Copy the following files from the software CD/DVD to a folder on the MC-1100.
   mxdgio.dll: \examples\MC-1100-W7E-example\3.lib\mxdgio\x64\
   mxGeneralIo.dll: \examples\MC-1100-W7E-example\3.lib\MxGeneralIo\x64\
   DIO.exe: \examples\MC-1100-W7E-example\x64\Release\

2. Execute **DIO.exe**.

```
D:\Project\mc1100\example\x64\4.DIO\DIO.exe
DIO Test Program
        (0) Exit Program
        (1) Display DIN
        (2) Display DOUT
        (3) Set DOUT value
        (4) Display both DIN and DOUT
```

3. Type **4** to display the current DI and DO values.

4. Type **3** to set the DOUT port number, and then follow the onscreen instructions.

5. Type **4** to check if the port value was set correctly.

Watchdog

1. Copy the following files from the software CD/DVD to a folder on the MC-1100.

   mxdwg.dll: \examples\MC-1100-W7E-example\3.lib\mxdwg\x64\

   mxGeneralIo.dll: \examples\MC-1100-W7E-example\3.lib\MxGeneralIo\x64\

   Watchdog.exe: \examples\MC-1100-W7E-example\x64\Release\

2. To prevent the system from rebooting, press [Enter] at least once every 10 seconds; otherwise, the system will reboot automatically.
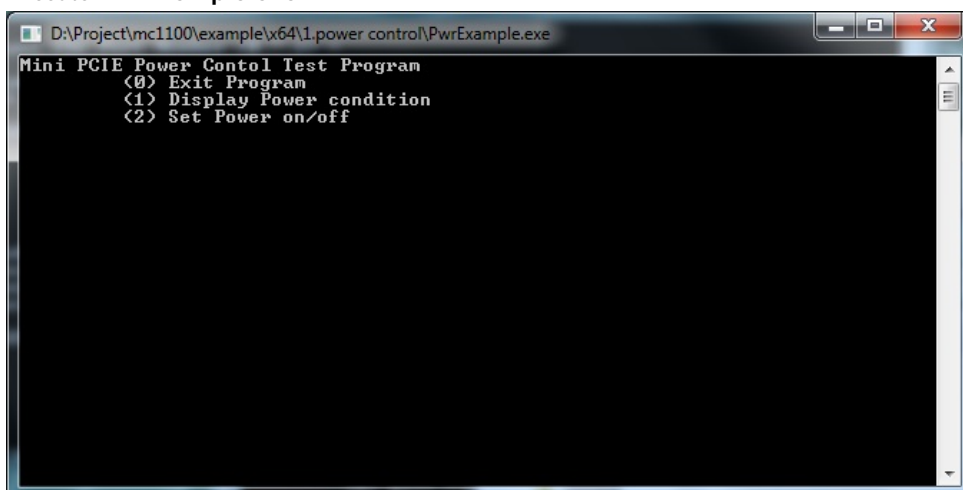
   Press **q** and **ENTER** to exit the program.

Power Control
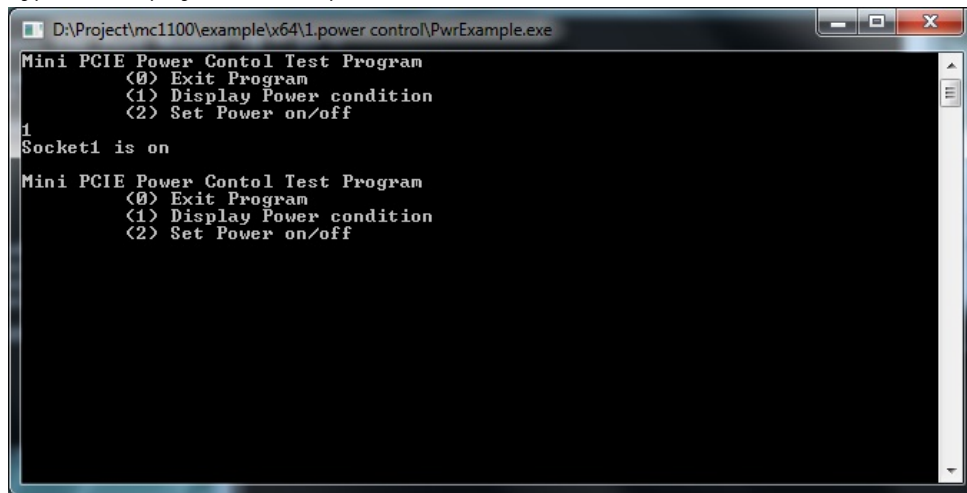
In this section, we illustrate how to use the test utility to control power through the mini-PCIE interface.

1. Copy the following files from the product software DVD.

   mxgpio.dll: \examples\MC-1100-W7E-example\3.lib\mxgpio\x64\

   mxGeneralIo.dll: \examples\MC-1100-W7E-example\3.lib\MxGeneralIo\x64\

   PwrExample.exe: \examples\MC-1100-W7E-example\x64\Release\

2. Execute **PwrExample.exe**.

3. Type **1** to display the current power status.
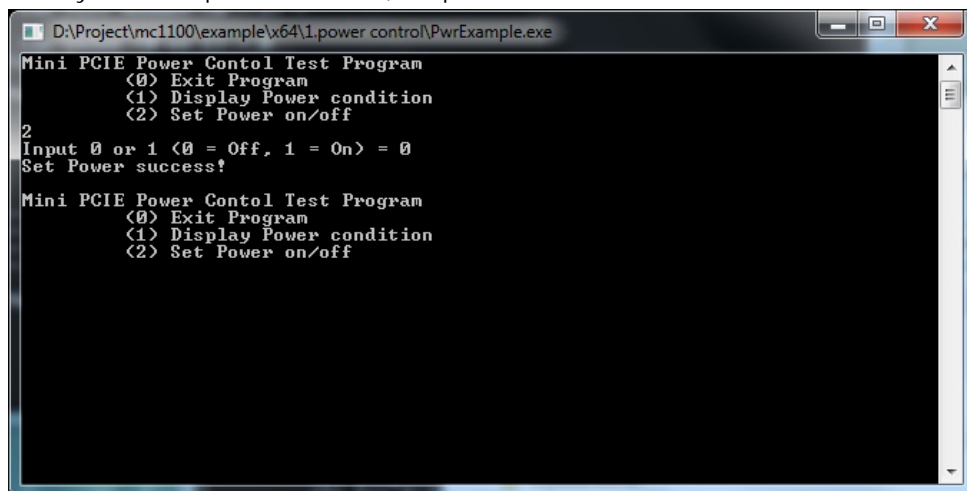
4. Type **2** and follow the onscreen instructions to set the power value.

When you set the power value to 0, the power turns off.

When you set the power value to 1, the power turns on.