V2201 Series Hardware User’s Manual

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A. **Regulatory Approval Statement** .......................................................................................... A-1
Moxa’s V2201 ultra-compact x86 embedded computers are based on the Intel® Atom™ E3800 series processor, feature the most reliable I/O design to maximize connectivity, and support dual wireless modules, making them suitable for a diverse range of communication applications. The computers’ thermal design ensures reliable operation in temperatures ranging from -40 to 85°C (-40 to 70°C for wireless operation with a special-purpose Moxa wireless module installed). The V2201 series supports “Moxa Hardware Monitoring” for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely 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
- V2201 Hardware Specifications
- Hardware Block Diagram
Package Checklist

Each model is shipped with the following items:

- V2201 embedded computer
- Terminal block to power jack converter
- Wall 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

V2201 embedded computers support the following features:

- Intel Atom E3800 series processor with three performance options
- -40 to 85°C system operating temperature (-40 to 70°C with LTE module installed)
- Dual mini-PCIe sockets for wireless modules: WiFi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: 2 serial ports, 2 Ethernet LAN ports, 4 DIs, 4 DOs, SD, USB, HDMI, wireless
- EN 61000-6-2 and EN 61000-6-4 certification*; meets EMC standard for heavy industry
- Up to 5 Grms anti-vibration and 100 G anti-shock
- Ready-to-run Debian 7, Windows Embedded Standard 7 platforms
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa SmartRecovery utility to recover system from boot failure (W7E only)

*Passed with AC/DC adapter.

V2201 Hardware Specifications

**Computer**

**CPU:**
- V2201-E1 Series: Intel® Atom™ Processor E3815 (Single Core, 512K Cache, 1.46 GHz)
- V2201-E2 Series: Intel® Atom™ Processor E3826 (Dual Core, 1M Cache, 1.46 GHz)
- V2201-E4 Series: Intel® Atom™ Processor E3845 (Quad Core, 1M Cache, 1.91 GHz)
- OS: Windows Embedded Standard 7 64-bit or Linux Debian 7 64-bit

**System Memory:** 1 DDR3 SO-DIMM slot, 8 GB max.
- E3815 and E3826 support DDR3L-1066
- E3845 supports DDR3L-1333

**USB:** 1 bootable USB 3.0 port, 2 bootable USB 2.0 ports (type A)

**Storage**

**mSATA:** 1 internal mini-PCIe socket for OS storage

**SD:** 1 SD 3.0 (SDHC/SDXC) socket for storage expansion*

*W7E only supports SD 2.0

**Audio**

**Output:** Line-out interface (together with HDMI)

**Other Peripherals**

**Expansion Slot:** 2 Mini-PCIe sockets
- 1 USB signal, for Sierra Wireless 3G/LTE module
- 1 USB + PCIe signal

**USIM:** 1 USIM slot
**Display**
Graphics Controller: Intel® HD (integrated)
Connector Type: 1 HDMI connector (type A)
Display Interface: Supports HDMI 1.4a, 1920 x 1080 pixels @ 60/24 bpp

**Ethernet Interface**
LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)
Isolation Protection: 1.5 kV

**Wireless SMA Interface**
Wi-Fi: 2 SMA connectors
3G/LTE: 2 SMA connectors
GPS: 1 SMA connector

**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 (non-standard baudrates supported; see user’s manual for details)

**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: 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: 4, sink type
Output Current: Max. 200 mA 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, user-defined
Storage: mSATA, SD
LAN: 2 LEDs per port (10/100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)
Wireless: Wireless 1, Wireless 2

**Switches and Buttons**
Power Switch: on/off (left-side panel)
Reset Button: For warm reboot (left-side panel)
**Physical Characteristics**
- **Housing:** Aluminum
- **Weight:** 940 g
- **Dimensions:**
  - Without ears: 150 x 48.8 x 120.2 mm (5.91 x 1.92 x 4.73 in)
  - With ears: 178 x 52.5 x 120.2 mm (7.01 x 2.07 x 4.73 in)
- **Mounting:** DIN rail, wallmount

**Environmental Limits**

**Operating Temperature:**
- E1/E2 models: -40 to 85°C (-40 to 185°F)
- E4 models: -40 to 70°C (-40 to 158°F)
- E1-W/E2-W/E4-W models with Moxa recommended wireless modules (3G/LTE + Wi-Fi) installed: -40 to 70°C (-40 to 158°F)

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

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

**Anti-Vibration:** 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, SD

**Anti-Shock:** 100 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, SD

**Power Requirements**
- **Input Voltage:** 9 to 36 VDC (3-pin terminal block for V+, V-, SG)
- **Power Consumption:** 18 W (2 A @ 9 VDC)

**Standards and Certifications**
- **Safety:** UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, CCC, UL 508
- **EMC:** EN 55032 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A, EN 61000-6-2*, EN 61000-6-4*
- **Green Product:** RoHS, CRoHS, WEEE
  - *Passed with AC/DC adapter

**Reliability**
- **Automatic Reboot Trigger:** Software-programmable watchdog timer configurable from 1 to 255 seconds

**Warranty**
- **Warranty Period:** 3 years
- **Details:** See www.moxa.com/warranty

*Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.*
Hardware Block Diagram
The V2201 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
- Dimensions (unit = mm)
- LED Indicators
- Reset Button
Appearance

**Front View**
- 3G/LTE Antenna Connector (SMA)
- Wi-Fi Antenna Connector (SMA)
- HDMI (Type A)
- USB 2.0 Host x 2 (Type A)
- Serial Ports x 2 (DB9)
- 10/100/1000 Mbps LAN Ports x 2 (RJ45)
- LED Indicator x10

**Right Side View**
- GPS Antenna Connector (SMA)
- USB 3.0 Host x 1
- Up: SDHC/SDXC Slot x 1
- Down: µSIM Card Slot x 1

**Left Side View**
- Power Button
- Reset Button
- DI x 4
- Grounding Screw (M4)
- Power Input (3-pin terminal block)
- Power Input (DC 9~36V)

![Diagram of the V2201 Series Hardware with labels for various components and connections]
Dimensions (unit = mm)
LED Indicators

<table>
<thead>
<tr>
<th>LED Name</th>
<th>Status</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>Green</td>
<td>Power is on and computer is functioning normally.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Power is off</td>
</tr>
<tr>
<td><strong>User Defined</strong></td>
<td>Red</td>
<td>Event has occurred</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No alert</td>
</tr>
<tr>
<td><strong>mSATA</strong></td>
<td>Yellow</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected / No data transmission</td>
</tr>
<tr>
<td><strong>SD Card</strong></td>
<td>Yellow</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected / No data transmission</td>
</tr>
<tr>
<td><strong>Wireless 1</strong></td>
<td>Green</td>
<td>Steady On: Link is On</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
<tr>
<td><strong>Wireless 2</strong></td>
<td>Green</td>
<td>Steady On: Link is On</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
<tr>
<td><strong>LAN 1</strong></td>
<td>Yellow</td>
<td>Steady On: 1000 Mbps Ethernet link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Steady On: 100 Mbps Ethernet link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>10 Mbps Ethernet link or LAN is not connected</td>
</tr>
<tr>
<td><strong>LAN 2</strong></td>
<td>Yellow</td>
<td>Steady On: 1000 Mbps Ethernet link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Steady On: 100 Mbps Ethernet link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>10 Mbps Ethernet link or LAN is not connected</td>
</tr>
<tr>
<td><strong>Tx 1</strong></td>
<td>Green</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
<tr>
<td><strong>Tx 2</strong></td>
<td>Green</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
<tr>
<td><strong>Rx 1</strong></td>
<td>Yellow</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
<tr>
<td><strong>Rx 2</strong></td>
<td>Yellow</td>
<td>Blinking: Data is being transmitted</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

Reset Button

Press the "Reset Button" on the left side panel of the V2201 to reboot the system automatically.
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 V2201**
- **Wiring Requirements**
  - Connecting the Power
  - Grounding the Unit
- **Connecting Data Transmission Cables**
  - Installing the Wireless Modules
  - Connecting to the Network
  - Connecting to a Serial Device
  - Installing an SDHC/SDXC Card
- **Connecting to a USB Device**
- **DI/DO**
- **Connecting to an HDMI Monitor**
- **RTC Battery Replacement**
Installing the V2201

**Wall or Cabinet Mounting**

The V2201 comes with two metal brackets for attaching it to a wall or the inside of a cabinet.

**Step 1:** Use two screws for each bracket and attach the brackets to the rear of the V2201.

**Step 2:** Use four screws per side to attach the V2201 to a wall or cabinet.

**Din-Rail Mounting**

The V2201 can be installed on a DIN-rail with the optional DIN-rail kit. This DIN-rail kit must be purchased separately. The DIN-rail kit includes one DIN-rail bracket and four screws.
The DK-DC50131 die-cast metal kit must be purchased separately. The kit is easy to install and makes the operation of the V2201 more robust. To install the DIN-rail mounting kit, use 4 screws to tightly attach the DIN-rail mounting bracket to the V2201’s side panel.

**NOTE**  
Use all four screws to ensure that the V2201 is safely and securely installed on the DIN rail.

**Installation:**

**STEP 1:**  
Insert the upper lip of the DIN rail into the DIN-rail mounting kit.

**STEP 2:**  
Press the V2201 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 V2201 forward and lift up to remove it from the DIN-rail.

**STEP 4:**  
Press the recessed button on the spring-loaded bracket to lock it into position for next use.
Wiring Requirements

In this section, we describe how to connect serial devices to the V2201 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 V2201.

**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

To power on the V2201, connect the "terminal block to power jack converter" to the V2201’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.

**ATTENTION**

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.
SG: The Shielded Ground (sometimes called Protected Ground) contact is the right most of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.

**Connecting Data Transmission Cables**

In this section, we describe how to connect the V2201 embedded computer to a network and serial devices.

**Installing the Wireless Modules**

**ATTENTION**

V2201 series “-W” models (e.g., V2201-E2-W-T) include a cellular card heat sink and 5 x wireless SMA connectors, which are installed during the production process.

The V2201 features two mini-PCIe sockets on the bottom panel. One socket supports USB signals only using MC9090, MC7354, or MC7354 mini-PCIe cards. The other socket supports standard USB + PCIe signals.

**STEP1:** Loosen the four screws in the middle of the bottom panel and open the bottom cover.

There are two mini-PCIe sockets:

Socket 1: USB signal, for 3G/LTE mini-PCIe card (Sierra Wireless MC9090, MC7304, MC7354).

**NOTE** Cellular card heat sink is installed in socket 1.

Socket 2: Standard USB + PCIe signal, for Wi-Fi mini-PCIe cards.
**STEP 2:** Insert the wireless module card at an angle.

**STEP 3:** Push down the wireless module card and then use the 2 screws included in the package to attach it to the V2201.

**STEP 4:** Connect the connectors with the corresponding wireless module cards.

The following figure illustrates 5 connectors in the mini-PCIe sockets:
No.1 & No.3: Wi-Fi mini-PCIe card
No.2 & No.4: 3G/LTE mini-PCIe card
No.5: GPS

**STEP 5:** Replace the bottom cover.

**STEP 6:** You may also purchase external antennas for 3G, 4G, and Wi-Fi from Moxa. Please contact a Moxa sales representative for information. When installed, the product should appear as shown below:
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 V2201 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.

![Ethernet Port Diagram]

<table>
<thead>
<tr>
<th>Pin</th>
<th>10/100 Mbps</th>
<th>1000 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ETx+</td>
<td>TRD(0)+</td>
</tr>
<tr>
<td>2</td>
<td>ETx-</td>
<td>TRD(0)-</td>
</tr>
<tr>
<td>3</td>
<td>ERx+</td>
<td>TRD(1)+</td>
</tr>
<tr>
<td>4</td>
<td>–</td>
<td>TRD(2)+</td>
</tr>
<tr>
<td>5</td>
<td>–</td>
<td>TRD(2)-</td>
</tr>
<tr>
<td>6</td>
<td>ERx-</td>
<td>TRD(1)-</td>
</tr>
<tr>
<td>7</td>
<td>–</td>
<td>TRD(3)+</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>TRD(3)-</td>
</tr>
</tbody>
</table>
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:

![DB9 Male Port Diagram]

<table>
<thead>
<tr>
<th>Pin</th>
<th>RS-232</th>
<th>RS-422</th>
<th>RS-485 (4-wire)</th>
<th>RS-485 (2-wire)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td>TxD(-)</td>
<td>TxD(-)</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>RxD</td>
<td>TxDB(+)</td>
<td>TxDB(+)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TxD</td>
<td>RxDB(+)</td>
<td>RxDB(+)</td>
<td>DataB(+)</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>RxDA(-)</td>
<td>RxDA(-)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>DSR</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Installing an SDHC/SDXC Card

The V2201 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 V2201 from its power source.
2. The SD slot is located on the right side of the front panel. Loosen the screws on the SD/SIM card cover.
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.

![SD Slot Diagram]

**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/SIM card cover.
Connecting to a USB Device

The V2201 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.

DI/DO

The V2201 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.
Connecting to an HDMI Monitor

The V2201 comes with a type A HDMI female connector on the front panel to connect an HDMI monitor.

The screw hole above the HDMI connector can be used to install a customized lock for the HDMI connector (note that different HDMI connector are not all the same).

Please contact a Moxa sales representative if you would like to order a customized lock.

The lock for the screw hole
RTC Battery Replacement

The V2201’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 V2201 embedded computer can be customized to support an easy RTC battery replacement function. Please contact your Moxa sales representative for details.
In this chapter, we describe the BIOS settings for the V2201 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**.

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.

Advanced Settings

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

This screen allows you to configure the initial status of the Numlock key when the computer boots up.

Options: On (default), Off

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 4 Speed**

Configure PCIe Port4 Speed

Options: Auto, Gen1 and Gen2
USB Configuration

**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

<table>
<thead>
<tr>
<th>SDR25 Capability Support for SD Card</th>
<th>&lt;Enabled&gt;</th>
<th>Disable/Enable SDR25 Capability in SD Card controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDR50 Capability Support for SD Card</td>
<td>&lt;Disabled&gt;</td>
<td></td>
</tr>
</tbody>
</table>

**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

### Power ON after Power Failure

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

<table>
<thead>
<tr>
<th>DO-0 Level</th>
<th>High (default), Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO-1 Level</td>
<td>High (default), Low</td>
</tr>
<tr>
<td>DO-2 Level</td>
<td>High (default), Low</td>
</tr>
<tr>
<td>DO-3 Level</td>
<td>High (default), Low</td>
</tr>
</tbody>
</table>
## SATA Configuration

### Chipset SATA Mode

Select SATA mode

Options: AHCI (default), IDE

### SATA Speed

Select SATA Speed

Options: Gen1 (default), Gen2
**Console Redirection**

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.

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.
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.

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].
Power Settings

The screen allows you to configure power settings.

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)
V2201 Series Hardware

BIOS Setup

- Make an LPM
- Make on S5
- Make on S5 Time
- Day of Month

This feature is used to wake the system by a LPM device from a remote host.
Options: Enabled (default), Disabled

Make an RIC from S5 state, By Day of Month or Fixed time of every day

Help  |  Select Item  |  Change Values  |  Setup Defaults
Exit  |  Select Item  |  Enter Select SubMenu  |  Exit and Exit
Boot Settings

The screen allows you to configure boot settings.

**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 the 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.
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: **V2201_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 V2201 Computer

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

2. Select USB Disk as the first boot source and press [Enter] to continue.

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 V2201 folder, type `cd V2201`.

4. Run the upgrade program by typing `V2201S10.exe`.

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

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:\> V2201> V2201S10.exe
Option: -bios -all -nv

Please do not remove the AC power!

Insyde H20FFT (Flash Firmware Tool) Version (SEG) 100.00.07.20
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Initializing

Current BIOS Model name: V2201
New BIOS Model name: V2201

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

Updating Block at FFFFF000

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.

<table>
<thead>
<tr>
<th>BIOS Version</th>
<th>V1.00S10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name</td>
<td>V2201</td>
</tr>
</tbody>
</table>
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.