

X2 Industrial PC

User Manual

1. Product Introduction

The X2 Industrial PC is a fully integrated industrial computer system based on the Intel® Celeron™ J4125 platform. It is designed for industrial automation, network communication, edge computing, and embedded control applications that require high reliability, long-term stability, and flexible I/O expansion.

The system integrates motherboard, power management, storage, network, and I/O interfaces into a compact aluminum alloy fanless enclosure. All descriptions in this manual are derived from the motherboard specification, complete system user manual, and system circuit/block diagram provided for the X2 series.

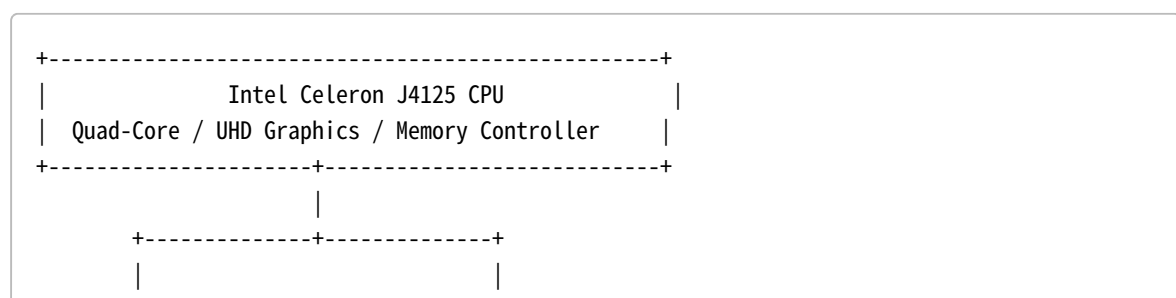
This document is prepared specifically to support FCC certification and laboratory testing.

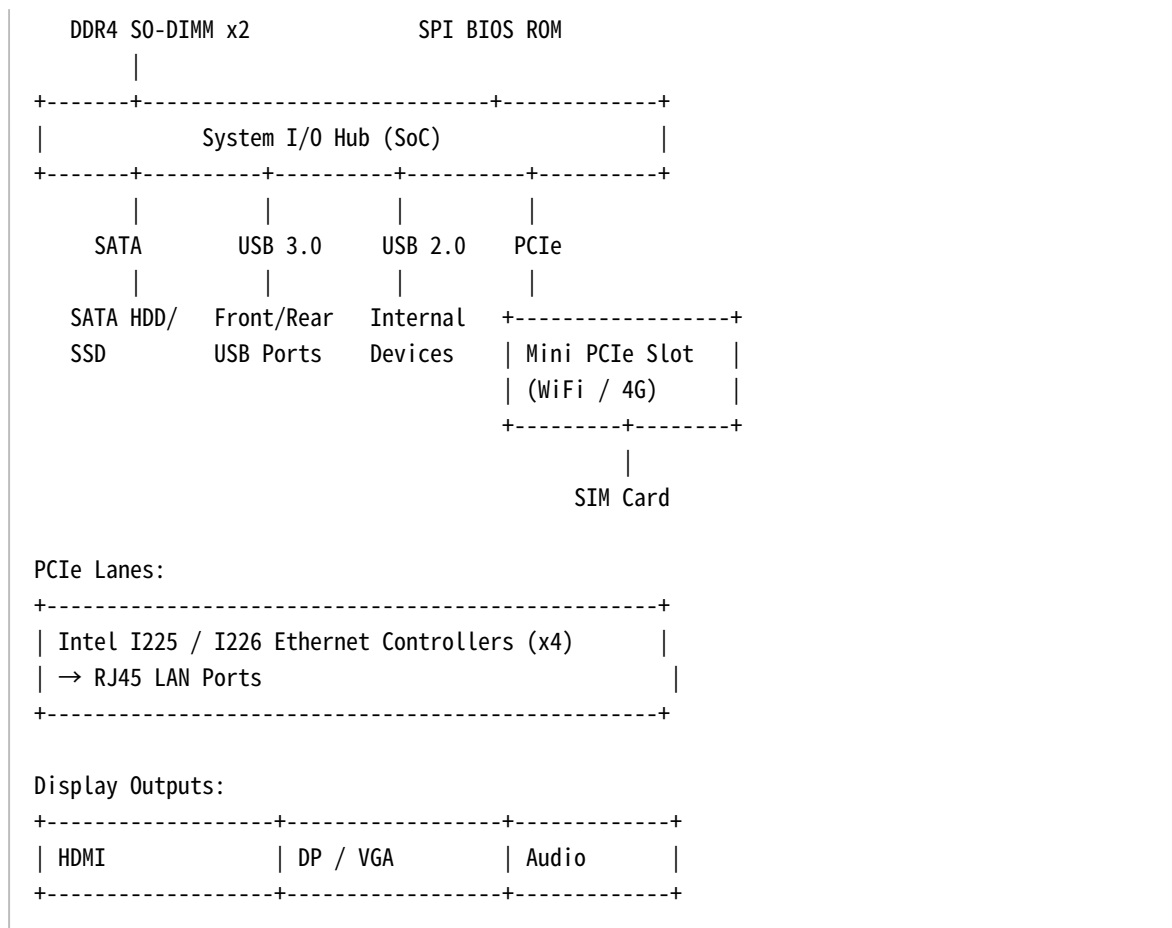
2. Product Features

- Intel® Celeron™ J4125 quad-core processor (Gemini Lake Refresh)
 - Fanless aluminum alloy enclosure for silent operation
 - Low power consumption (10W TDP)
 - Dual DDR4 SO-DIMM memory support
 - Multiple storage interfaces: SATA, mSATA, M.2 2280
 - Up to four Intel® 2.5GbE Ethernet ports
 - Rich industrial I/O including USB, COM, SIM, Mini PCIe
 - Supports Auto Power On, PXE Boot, Wake-on-LAN, Watchdog
 - Wide temperature operating capability
 - Designed for CE / FCC / RoHS compliance
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3. System Block Diagram (Functional Overview)

Below is a functional block representation of the X2 Industrial PC architecture, based on the system circuit diagram:





4. Hardware Specifications

4.1 Processor

- Model: Intel® Celeron™ J4125
- Architecture: Gemini Lake Refresh
- Cores / Threads: 4 / 4
- Base Frequency: 2.0 GHz
- Cache: 4 MB
- Package: FCBGA1090
- TDP: 10W

4.2 Memory

- 2 × DDR4 260-pin SO-DIMM slots
- Memory voltage: 1.2V
- Supported speed: up to 2400 MT/s
- Maximum capacity: 8 GB

4.3 Storage Interfaces

- 1 × SATA 2.0 (7-pin) data connector
- 1 × SATA power connector (12V / 5V)

- 1 × mSATA (via Mini PCIe)
- 1 × M.2 2280 SSD slot (PCIe 2.0 x1)

4.4 Network

- 4 × RJ45 Ethernet ports
- Controller: Intel® I225 / I226
- Speed: 10/100/1000/2500 Mbps adaptive
- Supports PXE Boot and Wake-on-LAN

4.5 USB Interfaces

- 2 × USB 2.0
- 2 × USB 3.0

4.6 Display Interfaces

- 1 × HDMI (with audio output)
- 1 × DisplayPort or VGA (model dependent)

4.7 Serial Communication

- 1 × COM port header
- Supports RS-232 / RS-485 (jumper selectable)

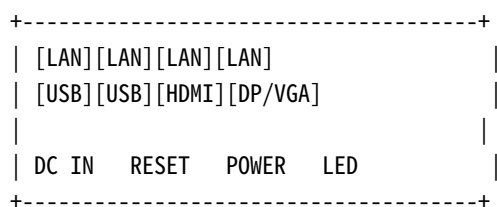
4.8 Expansion Interfaces

- 1 × Mini PCIe slot (WiFi / Bluetooth / 4G module)
- 1 × SIM card slot (for 4G module)

5. Mechanical Specifications

- Enclosure: Aluminum alloy
- Cooling: Fanless passive cooling
- Dimensions: 136 × 126 × 40 mm
- Net weight: approx. 0.75 kg
- Gross weight: approx. 1.25 kg

5.1 External Appearance Diagram (Reference)



6. Power Specifications

- Input voltage: DC 12V
 - Recommended adapter: DC 12V / 4A
 - Connector size: 5.5 mm × 2.5 mm
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7. Environmental Specifications

- Operating temperature:
 - Commercial HDD: 0°C ~ +50°C
 - Industrial SSD: -20°C ~ +50°C
 - Storage temperature: -20°C ~ +70°C
 - Relative humidity: 5% ~ 90% (non-condensing)
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8. Installation Instructions

8.1 Anti-Static Precautions

- Always disconnect power before installation
- Wear an anti-static wrist strap when handling components
- Hold PCB by edges only

8.2 Memory Installation

1. Power off the system and disconnect DC input
2. Insert DDR4 SO-DIMM at 30° angle
3. Press down until side clips lock

8.3 Storage Installation

- Secure SATA or M.2 SSD properly
- Ensure SATA power polarity (+12V / +5V) is correct

8.4 SIM Card Installation

- Insert SIM card with chip facing downward
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9. Jumper and Switch Settings

9.1 CLR_CMOS

- Pin 1-2: Normal operation (default)
- Pin 2-3: Clear CMOS

9.2 AUTO_PWRON

- Pin 1-2: Auto power on after power recovery

- Pin 2-3: Normal power on mode

9.3 COM Mode Selection

- RS-232 / RS-485 selectable via jumpers
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10. System Operation Flow

Power Input → BIOS Initialization → Device Detection → OS Boot

- Press **DEL** during boot to enter BIOS
 - Configure boot device, PXE, and power management
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11. Troubleshooting

- No power: Check DC adapter and input voltage
 - No display: Verify display cable and output mode
 - Network failure: Check BIOS and driver installation
 - System reboot: Check cooling and power stability
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FCC Warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.