



NUC16R-D4 User Manual

Issue 1.1

www.CoreIPC.com

Security Guidance

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- To help you use the CoreIPC motherboard, please read the [User Manual] carefully.
 - For product-related information, please be sure to read these safety instructions carefully.
 - Identifying the Product Version
You can find the version of this motherboard labeled [Issue:X.X] on the motherboard itself. X.X represents a number; for example, a label reading [Issue1.0] indicates that the version of this motherboard is 1.0. Please note the product version when updating the motherboard's BIOS or drivers, or when referring to other technical documentation.

Basic Safety Tips

1. Before using this product, please be sure to read the product manual carefully.
2. Any cards not yet ready for installation should be stored in anti-static bags.
3. Before removing the board from the antistatic bag, place your hand on a grounded metal object for a moment (such as 10 seconds) to discharge any static electricity from your body and hands.
4. When handling circuit boards, you must wear anti-static gloves and make it a habit to touch only the edges.
5. To prevent electric shock or damage to the product, be sure to turn off the AC power before inserting, removing, or reconfiguring the board.
6. Before moving a board or the entire unit, you must first turn off the AC power.
7. For complete systems, be sure to turn off the AC power before adding or removing any boards.
8. Before connecting or disconnecting any device, you must first turn off the AC power.

9. To avoid unnecessary damage to the product caused by frequent power cycles, wait at least 30 seconds after turning it off before turning it back on.

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Ordering Information

No.	Model	CPU	Cores	Freq.	TDP	Memory	HDMI	DP	LAN	USB	PS2	LPT	COM/ 485	POWER
1	NUC16R-D4 VER1.1	N95	4	Up to 3.4G	15W	DDR4	1	1	6	7	/	/	2 / 0	12V
2	NUC16R-D4 VER1.1	N100	4	Up to 3.4G	6W	DDR4	1	1	6	7	/	/	2 / 0	12V
3	NUC16R-D4 VER1.1	N200	4	Up to 3.7G	6W	DDR4	1	1	6	7	/	/	2 / 0	12V
4	NUC16R-D4 VER1.1	I3-N305	8	Up to 3.8G	15W	DDR4	1	1	6	7	/	/	2 / 0	12V
5	NUC16R-D4 VER1.1	N150	4	Up to 3.6G	6W	DDR4	1	1	6	7	/	/	2 / 0	12V
6	NUC16R-D4 VER1.1	N250	4	Up to 3.8G	6W	DDR4	1	1	6	7	/	/	2 / 0	12V

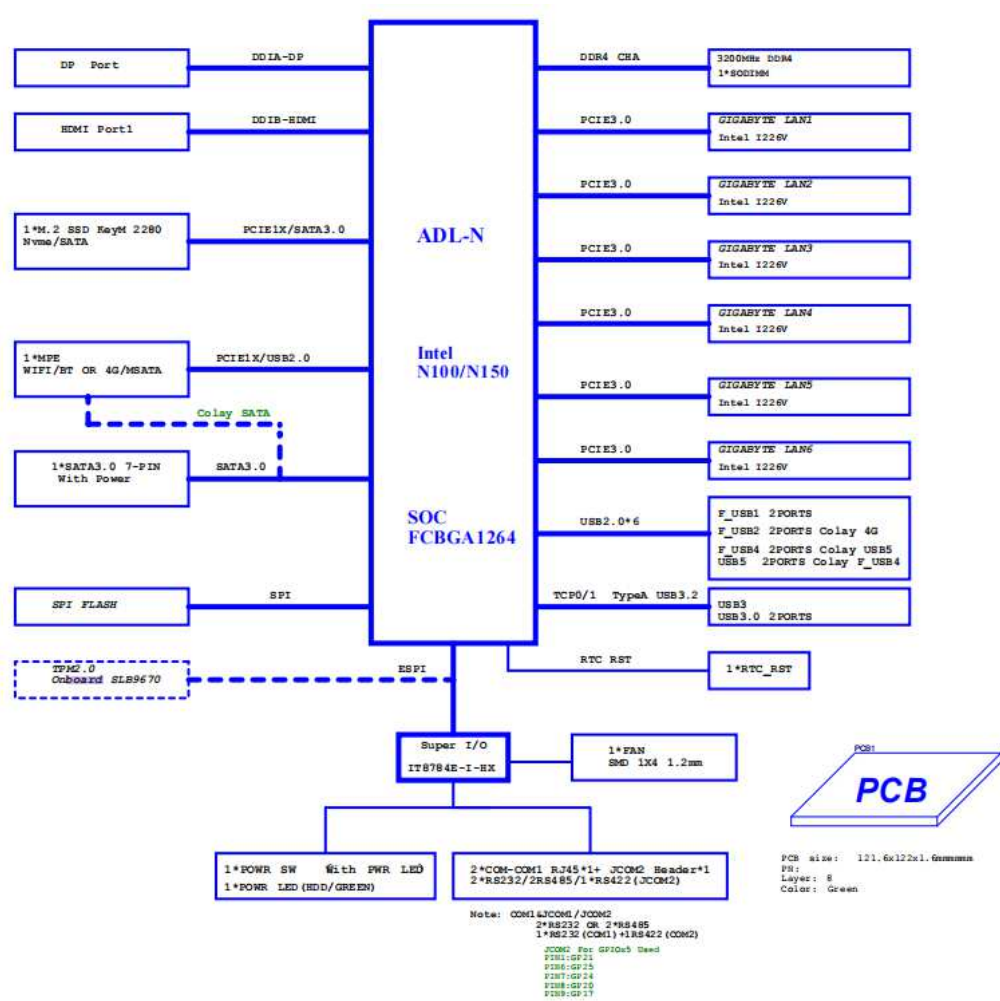
1. Product Description

NUC16-D4 is a CoreIPC NANO-series multi-LAN motherboard supporting the full range of Intel® Alder Lake processors. It is suitable for software routers, network security, industrial control, cloud terminals, and other applications.

The main features of the NUC16R-D4 motherboard are as follows:

- Integrated Intel® Celeron® N100 0.8 GHz quad-core processor; compatible with the full range of Intel® Alder Lake-N and Twin Lake-N processors;
- 1 × SO-DIMM slot supporting single-channel DDR4-3200 memory, up to 32 GB;
- Display output supports DP and HDMI;
- Supports up to 6 × Intel® I225-V or I226 2.5GbE interfaces;
- Supports 1 × Mini PCIe slot for Wi-Fi/4G and 1 × M.2 Key M 2280/2242 PCIe/SATA auto-detect SSD slot;
- Supports up to 2 × USB 3.0 ports and 5 × USB 2.0 ports;
- Provides 2 × RS-232 serial ports, with optional support for 1 × RS-485 or 1 × RS-422;
- Fanless cooling supports a sealed system design for dust and moisture protection;
- Supports a wide operating temperature range of -10°C to 60°C;
- Supports AT/ATX mode switching and 12 V DC power input.

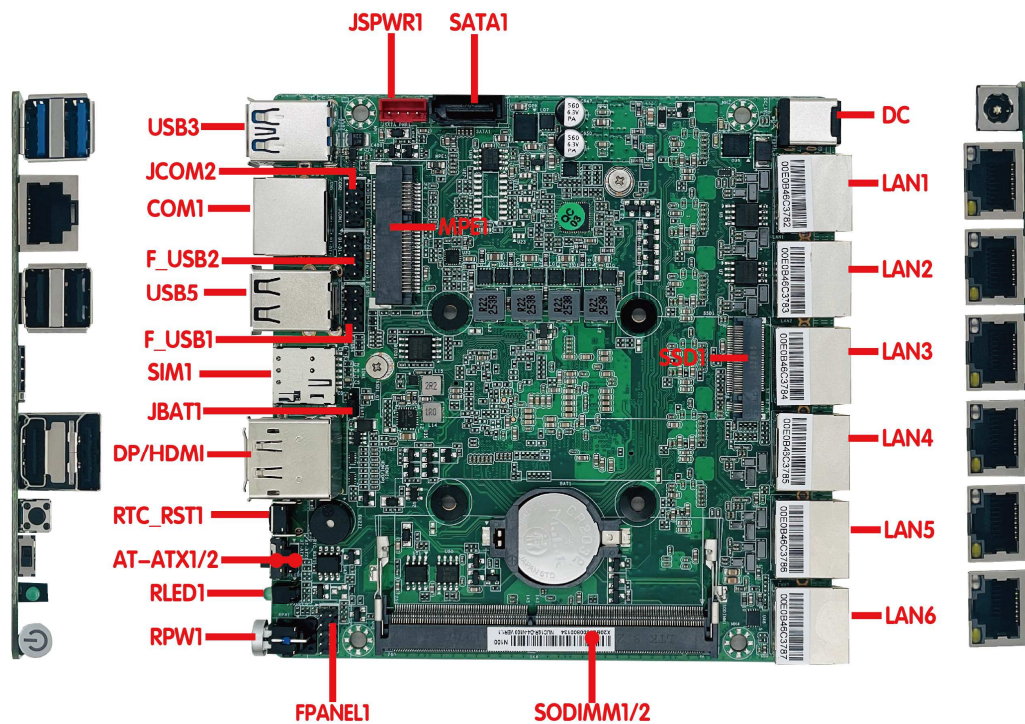
2. Motherboard Block Diagram



3. Motherboard Specifications

Item	Description
Processor	Integrated Intel® Celeron® N100 0.8 GHz quad-core processor, TDP 6 W Compatible with the full range of Intel® Alder Lake-N and Twin Lake-N processors
Memory	1 × SO-DIMM slot supporting single-channel DDR4-3200 memory, up to 16 GB
Display	Integrated Intel® UHD Graphics
	1 × HDMI 1 port (4K at 60 Hz) and 1 × DP port (4K at 60 Hz) Supports synchronous or asynchronous display through HDMI 1 and DP
Network	6 × Intel® I225 or I226 2.5GbE controllers with Wake-on-LAN and PXE support
Storage	1 × 7-pin SATA 3.0 drive connector with transfer rates up to 6 Gbps, mutually exclusive with the mSATA signal
	1 × M.2 Key M 2280/2242 PCIe/SATA auto-detect SSD slot
Expansion Slots	1 × Mini PCIe slot supporting 4G and Wi-Fi by default; mSATA support is available through hardware modification
Rear I/O	6 × Intel® I225-V or I226 2.5GbE ports
	1 × 12 V DC power input connector
Front I/O	2 × USB 3.0 ports
	2 × USB 2.0 ports
	1 × console port, optionally configurable as a 2 × 5-pin JCOM1 header with a 2.00 mm pitch; RS-485 support requires hardware modification
	1 × SIM card slot
	1 × stacked DP + HDMI display connector; both support 4K at 60 Hz
	1 × HDD activity LED
	1 × Clear CMOS push-button switch
	1 × auto power-on DIP switch
	1 × power button with LED
Onboard I/O	2 × 2 × 5-pin USB 2.0 headers supporting expansion of three USB 2.0 ports. One USB signal group on F_USB2 is shared with the 4G module; up to four USB 2.0 ports are available when the 4G function is not used.
	2 × COM headers. JCOM1 is not populated by default and can support RS-485 through hardware modification. JCOM2 is RS-232 by default and can be modified for RS-485/RS-422.
	1 × drive power connector
	1 × 2 × 5-pin front-panel switch and LED header
Fan Header	Rear-mounted CPU with fanless cooling design; 1 × 4-pin CPU fan header reserved
GPIO	Supports 5-channel input/output GPIO by sharing JCOM2 header signals; GPIO support requires custom hardware modification

TPM	Onboard TPM 2.0 footprint reserved
BIOS	128Mb Flash ROM
Watchdog	Supports hardware reset with 256 levels from 0 to 255 seconds
Operating System	Windows 10/Windows 11/Linux
Power Type	12 V DC power input
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Operating Humidity	5%–95% relative humidity, non-condensing
Dimensions	120mm x 120mm



Note: The image above shows the front view of the NUC16R-D4 VER1.1. Images of other models may differ.

The image can be enlarged for viewing. Pin 1 of each header is marked with a red triangle.

4. Board Installation

Safety Precautions

Before installing the motherboard, please read and follow the safety precautions below:

- Do not remove or damage the serial number label, distributor warranty label, or any other warranty-related labels on the motherboard before installation. Otherwise, it may affect the warranty validation.
- Before installing or removing the motherboard or any other hardware devices, make sure the power is turned off and the power cord is unplugged from the power outlet.
- When installing hardware devices into the motherboard connectors or slots, make sure the connectors are firmly and properly seated.
- When handling the motherboard, avoid touching the metal contacts or circuit areas to prevent short circuits.
- When handling the motherboard, CPU, or memory module, it is recommended to wear an anti-static wrist strap. If an anti-static wrist strap is not available, make sure your hands are dry and touch a grounded metal object first to discharge static electricity.
- Before installation, place the motherboard on an anti-static mat or inside an anti-static bag.
- Before unplugging the power connector from the motherboard, make sure the power supply is turned off.
- Before turning on the power, make sure the power supply voltage is set according to the local voltage standard.
- Before turning on the power, make sure all hardware cables and power cables are correctly connected.
- Do not allow screws to contact the circuits or components on the motherboard, as this may cause damage or malfunction.
- Make sure no screws or metal objects are left on the motherboard or inside the computer chassis.
- Do not place the computer system on an unstable surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the power during installation may cause damage to the motherboard, other devices, or personal injury.
- If you are not familiar with the installation process, or if you encounter any technical problems while using this product, please consult qualified technical personnel.

Memory Installation

This motherboard provides **1 × 260-pin DDR4 SO-DIMM memory slot**.

Before installing the memory module, please note the following:

- 1) Make sure the memory module you purchased is compatible with the specifications supported by this motherboard.
- 2) Before installing or removing the memory module, make sure the computer power is

turned off to prevent damage.

- 3) The memory module is designed with a foolproof notch. If the insertion direction is incorrect, the module cannot be inserted. In this case, please change the insertion direction immediately.

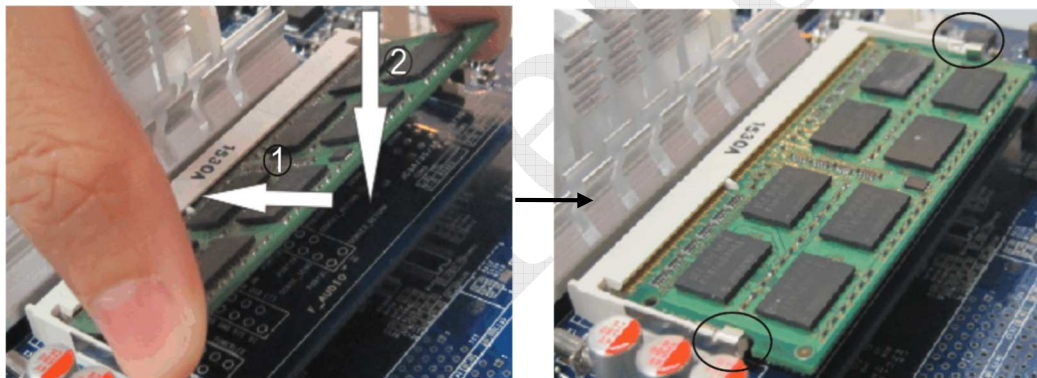
Memory Installation Steps:

- 1) Before installing or removing the memory module, turn off the power and unplug the AC power cord.
- 2) Carefully hold the memory module by both edges. Do not touch the metal contacts.
- 3) Align the gold fingers of the memory module with the memory slot. Make sure the notch on the memory module matches the key in the slot.
- 4) Insert the memory module into the slot at an angle of approximately 30 degrees, then gently press it down until you hear a “click” sound. This indicates that the memory module has been properly installed and is ready for use.

Note: Do not apply excessive force when pressing down the memory module to avoid damage.

- 5) To remove the memory module, push the retaining clips on both sides of the DIMM slot outward at the same time, then remove the memory module carefully.

Note: The installation diagram is for reference only.

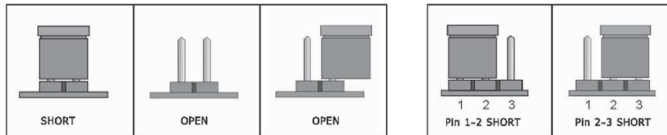


5. Jumper Settings

Jumper Description

For a **2-pin header**, installing a jumper cap on the two pins will close the circuit, creating a short connection.

For a **3-pin header**, the jumper cap can be installed on **Pin 1–2** or **Pin 2–3** to close the corresponding circuit and create a short connection.



How to Identify Pin 1 of a Jumper?

- 1) Carefully check the motherboard. The pin marked with “1” or indicated by a thick white line is usually Pin 1.
- 2) Check the solder pads on the back side of the motherboard. In most cases, the square solder pad indicates Pin 1.

Clear CMOS Jumper:

The motherboard provides 1 × 1×3-pin Clear CMOS header JBAT1 for clearing or retaining CMOS settings.

Pin pitch: 2.00 mm

The CMOS is powered by the onboard button battery. Clearing the CMOS will permanently erase the previous system configuration and restore the system settings to the default factory values.

To clear the CMOS, follow the steps below:

- 1) Turn off the computer and disconnect the power supply.
- 2) Short Pin 2–3 of JBAT1 for approximately 5 seconds.
- 3) Power on the computer.
- 4) During startup, follow the on-screen prompt to enter BIOS Setup, then load the optimized default settings.
- 5) Save the settings and exit BIOS Setup.

Pin definition is shown below:

JBAT1 Definition:

Function	JBAT1 Setting
Normal operation	1-2Pin
Clear CMOS and restore all BIOS settings to factory defaults	2-3Pin

AT/ATX Power Mode Jumper

The motherboard provides **1 × 1×3-pin AT-ATX1 jumper** for selecting the power-on mode.

Pin pitch: 2.00 mm

The power-on behavior can be configured by the jumper setting.

AT-ATX1 Definition:

Function	AT-ATX1 Setting
Disable Auto Power-on	1-2Pin (default)
Enable Auto Power-on	2-3Pin

6. Pin Definitions

6.1. The motherboard supports **two serial ports** through two standard DB9 RS-232 connectors. COM1 is configured as a console port by default and can be changed to a pin header or optionally configured as RS-485. JCOM2 can optionally be configured as RS-485/RS-422. Consult us before ordering for optional configurations.

Two optional onboard 2 × 5-pin serial headers, JCOM1 and JCOM2, are provided with a 2.0 mm pitch. JCOM1 shares the same signals as COM1. **The standard pin definitions of JCOM1/JCOM2 are as follows:**

PIN	Signal Name	PIN	Signal Name
1	DCD (A)	2	RXD (B)
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

Note: The standard motherboard supports only two RS-232 ports by default. RS-485 support requires hardware modification and advance production arrangement; contact our sales team before ordering.

6.2. The motherboard provides two 2 × 5-pin USB 2.0 headers with a 2.0 mm pitch. The F_USB1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	+5V	2	+5V
3	Data0-	4	Data1-
5	Data0+	6	Data1+
7	GND	8	GND
9		10	GND

6.3. The motherboard provides 1 × 2 × 5-pin FPANEL1 header with a 2.0 mm pitch. The chassis power switch, reset switch, HDD activity LED, and power LED can be connected to this header. The FPANEL1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	HDDLED+	2	PWRLED+
3	HDDLED-	4	PWRLED-
5	GND	6	PWRBTN#
7	RESETBTN#	8	GND
9	NC	10	

6.4. The motherboard provides 1 × optional 1 × 4-pin fan header. The CPUFAN1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	GND	2	+12V
3	DET	4	PWM

Note: DET: fan speed pulse output; PWM: fan speed PWM control.

6.5. The motherboard provides 1 × red 1 × 4-pin SATA drive power connector with a 2.0 mm pitch. The JSPWR2 pin definition is as follows:

PIN	Signal Name
1	+12V

2	GND
3	GND
4	+5V

Be sure to confirm the position of Pin 1 on JSPWR1; incorrect connection may damage the drive. Use the power cable supplied by CorelPC.

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