



NUC42R User Manual

Issue 1.2

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.

CoreIPC

Ordering Information

No.	Model	CPU	Cores	Freq.	Memory	HDMI	DP	LAN	USB	PS2	LPT	COM /485	POWER
1	NUC42R VER1.2	J4125	4	2.0G	DDR4	1	/	4	7	/	/	2 / 0	12-19V

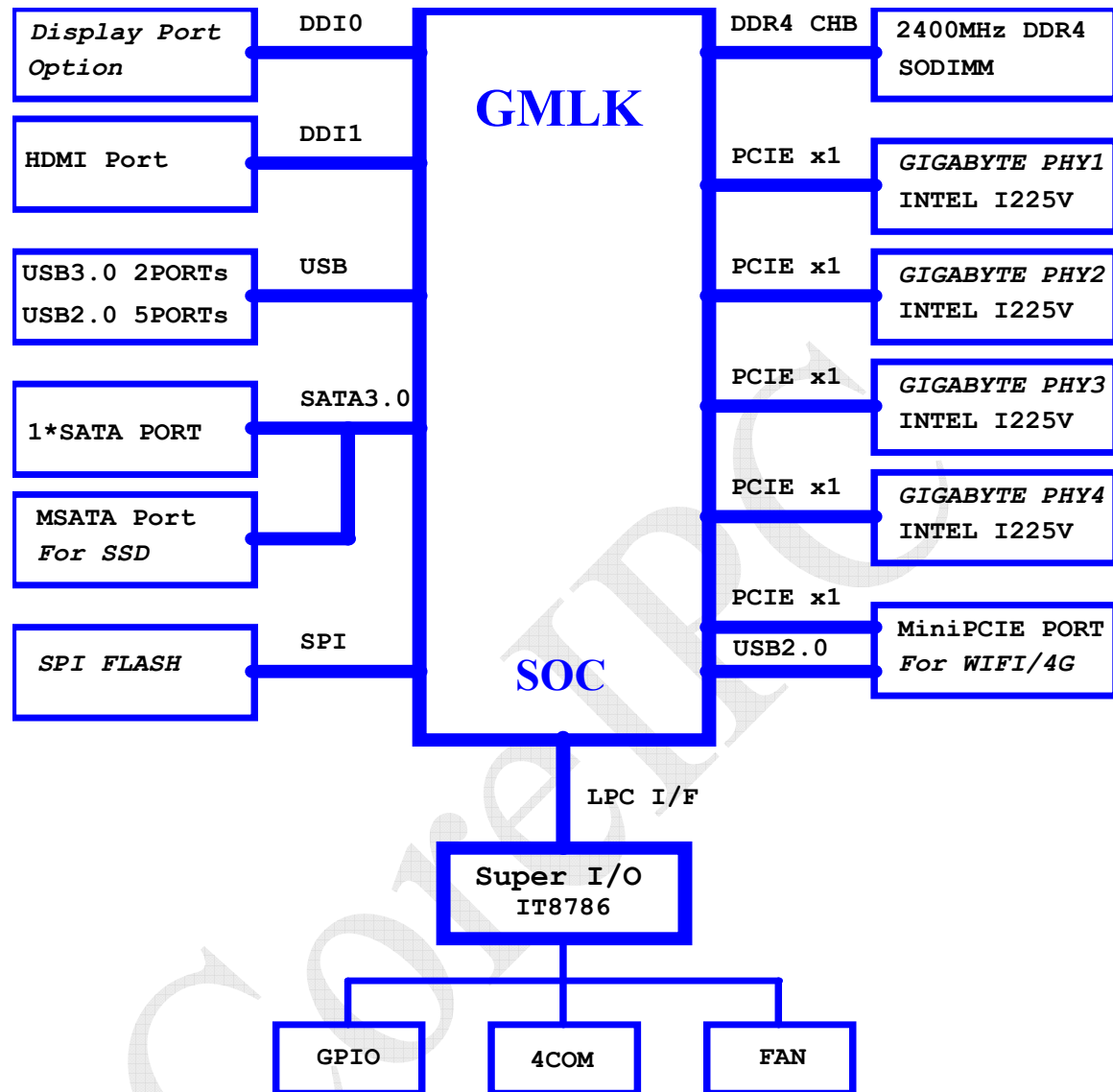
1. Product Description

NUC42R is a CoreIPC NANO-series multi-LAN motherboard supporting the full range of Intel® Gemini Lake Refresh processors. It is widely applicable to software routers, network security systems, industrial control, cloud terminals, and other applications.

The main features of the NUC42R motherboard are as follows:

- Integrated Intel® Celeron® J4125 2.0 GHz quad-core processor; compatible with the full range of Intel® Gemini Lake Refresh processors;
- 1 × SO-DIMM slot supporting single-channel DDR4-2400 memory, up to 16 GB;
- Supports dual displays through HDMI and DP (HDMI installed by default);
- Supports up to 4 × Intel® I225-V or I226 2.5GbE ports;
- Supports 1 × Mini PCIe slot for Wi-Fi/4G and 1 × mSATA slot;
- Supports up to 2 × USB 3.0 ports and 5 × USB 2.0 ports;
- Provides 2 × onboard RS-232 serial ports, optionally configurable as 2 × RS-485 ports;
- Fanless thermal design supports fully enclosed systems for improved dust and moisture resistance;
- Supports a wide operating temperature range of -20°C to 60°C;
- Supports AT/ATX power mode selection and 12–19 V DC power input.

2. Motherboard Block Diagram

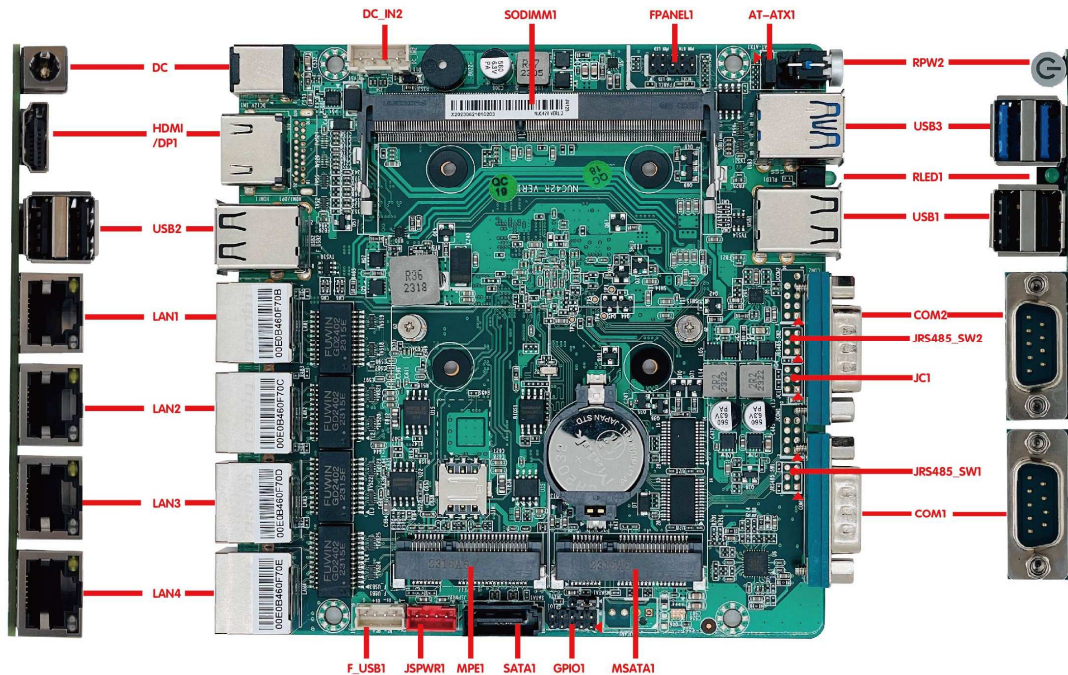


Note: COM1/2 can support RS232/485

3. Motherboard Specifications

Item	Description
Processor	Integrated Intel® Celeron® J4125 2.0 GHz quad-core processor, TDP 10 W Compatible with the full range of Intel® Gemini Lake Refresh processors
Memory	1 × SO-DIMM slot supporting single-channel DDR4-2400 memory, up to 16 GB
Display	Integrated Intel® UHD Graphics 600
	1 × HDMI port and 1 × optional DP port; supports simultaneous or independent HDMI/DP displays
LAN	4 × Intel® I225 or I226 2.5GbE controllers with Wake-on-LAN and PXE boot support
Storage	1 × 7-pin SATA 3.0 drive connector, transfer rate up to 6 Gbps
	1 × mSATA 3.0 slot
Expansion Slots	1 × Mini PCIe slot supporting a 4G or Wi-Fi module
Front I/O	2 × USB 2.0 ports
	1 × HDMI 1.4 display port and 1 × DP 1.2 4K display port (HDMI is populated by default; a stacked DP connector is optional)
	4 × Intel® I226-V RJ45 LAN ports
	1 × 12–19 V DC power input connector
Rear I/O	2 × USB 3.0 ports
	2 × USB 2.0 ports
	2 × DB9 RS-232 serial ports; COM1/COM2 can optionally support RS-485 through hardware modification
	1 × HDD activity LED
	1 × illuminated power button
Onboard I/O	1 × 1 × 4-pin USB 2.0 header; when 4G support is not required, two USB 2.0 ports can be supported through hardware modification
	2 × 2 × 5-pin COM headers; JCOM1/JCOM2 share signals with the front I/O serial ports and are optional
	1 × red drive power connector
	1 × 4-pin white power connector
	1 × 2 × 5-pin front-panel switch and LED header
Fan Header	Rear-mounted CPU with fanless thermal design; 1 × 4-pin CPU fan header reserved
GPIO	Supports 4-channel GPIO input/output
BIOS	64Mb Flash ROM
Watchdog	Supports hardware reset watchdog (256 levels, 0–255 seconds)

Operating System	Windows 10/Linux
Power Input	12–19 V DC power input
Operating Temperature	60°C ~ -20°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 NUC42R VER1.2. 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.

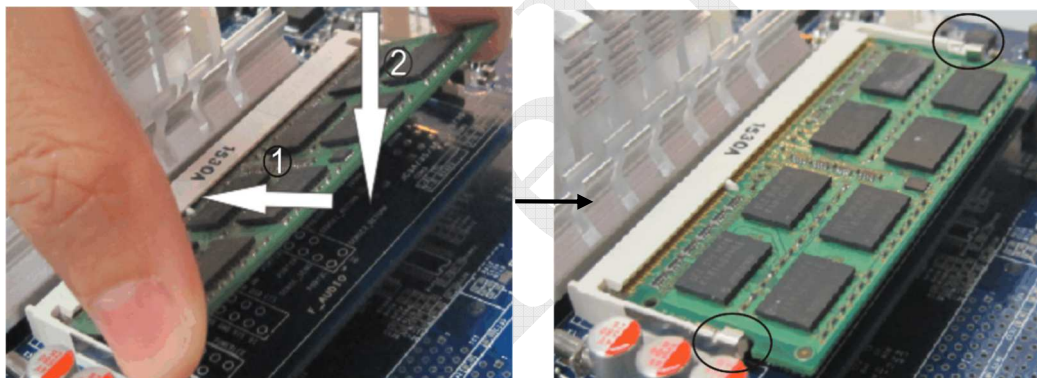
Memory Installation Steps:

- 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.

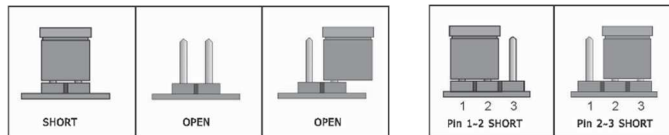


5. Jumper Settings

Jumper Description

For a 2-pin header, installing a jumper cap across the two pins closes the circuit (shorts the pins).

For a 3-pin header, install the jumper cap on Pins 1–2 or Pins 2–3 to close the corresponding circuit (short the pins).



How to Identify Pin 1 of a Jumper?

- 1) Carefully inspect the motherboard. A pin marked “1” or indicated by a red triangle is Pin 1.
- 2) Check the solder pads on the back of the motherboard. The square solder pad usually 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: 2.0 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	Pin 1–2 shorted
Clear CMOS and restore all BIOS settings to factory defaults	Pin 2–3 shorted

AT/ATX Power Mode Jumper

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

Pin pitch: 2.54 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
Enable Auto Power-on	2-3Pin

6. Pin Definitions

6.1. The motherboard supports 2 serial ports through 2 standard DB9 RS-232 connectors, which can be configured as 2 RS-485 ports. It also provides 2 × 2 × 5-pin serial headers with a 2.0 mm pitch. JCOM1 shares signals with COM1, and JCOM2 shares signals with COM2; only one interface in each pair can be used. JCOM1 and JCOM2 are not populated by default.

The standard pin definitions for JCOM1 and 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 2 × RS-232 ports. RS-485 support requires hardware and software modifications and must be specified when placing the order. Please contact CoreIPC sales.

6.2. RS-232/RS-485 Selection Settings for COM1 and COM2

RS-232 is supported by default. RS-485 requires hardware modification; please contact CoreIPC sales.

Interface	Function	JRS485_SW1 Setting	JC1 Setting	Definition
COM1	RS232	1-3Pin ,2-4Pin (default)	1-3Pin (default)	COM1 Pin 2: DCD COM1 Pin 3: RXD
	RS485	3-5Pin ,4-6Pin	3-5Pin	COM1 Pin 1: A COM1 Pin 2: B

Interface	Function	JRS485_SW2 Setting	JC1 Setting	Definition
COM2	RS232	1-3Pin ,2-4Pin (default)	2-4Pin (default)	COM2 Pin 2: DCD COM2 Pin 3: RXD
	RS485	3-5Pin ,4-6Pin	4-6Pin	COM2 Pin 1: A COM2 Pin 2: B

6.3. The motherboard provides 1 × 2 × 5-pin USB 2.0 header with a 2.0 mm pitch. By default, only one USB 2.0 port is supported.

When the Mini PCIe slot is not used for a 4G module, two USB 2.0 ports can be supported. 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

6.4. The motherboard provides 1 × 1 × 4-pin red SATA drive power connector with a 2.0 mm pitch. The JSPWR1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	+12V	2	GND

3	GND	4	+5V
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Be sure to identify Pin 1 of JSATA_PWR1 correctly; incorrect connection may damage the drive. Use only the power cable supplied by CoreIPC.

6.5. The motherboard provides 1 × 2 × 5-pin FPANEL1 header with a 2.0 mm pitch.

The chassis power switch, reset switch, HDD 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	

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

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

Note: DET is the fan-speed pulse output; PWM is the fan-speed PWM control signal.

6.7. The motherboard provides 1 × 2 × 5-pin GPIO header with a 2.0 mm pitch. The GPIO1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	GND	2	+5V
3	GPO1	4	GPI1
5	GPO2	6	GPI2
7	GPO3	8	GPI3
9	GPO4	10	GPI4