倍控®
BKHD

BKHD-C612NP-8LAN Motherboard

VER 1.1

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Safety Guide

To ensure optimal use of Beikong products, please review the user manual in its entirety. Before reviewing product-specific information, we kindly request that you carefully read the safety instructions.

Product Version Identification

The product version number can be found on the motherboard, where X.X represents a number. For example, if the version is indicated as [VER1.0], it signifies that the current version of the motherboard is 1.0. The BIOS interface homepage provides information such as [XXXXNP-XXXX], which denotes the BIOS version number utilized by the current product. When updating the motherboard's BIOS, driver, or referencing other technical documents, please refer to the product version label for the most up-to-date information.

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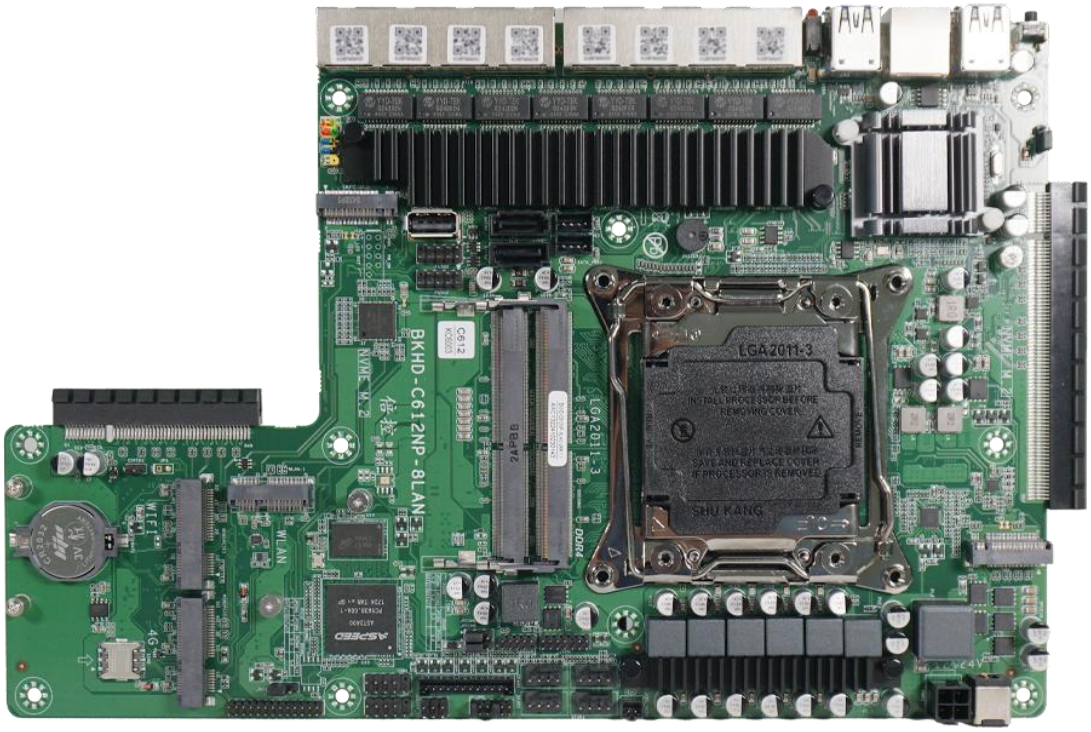
Product Images

Please be advised that products manufactured in different batches may exhibit slight variations in appearance. To ensure the most accurate representation, please refer to the actual received goods.



Product Profile

The C612-NP-8LAN-MB motherboard is a solution tailored for high-density networking and edge/industrial computing. It seamlessly integrates the exceptional networking capabilities of eight high-performance 2.5GbE ports, the reliable computing performance of the Intel Xeon platform, industrial-grade durability, and flexible expansion options into a compact form factor. Whether building next-generation network equipment, ruggedized edge servers, or industrial control systems deployed in harsh environments, it provides a powerful foundation that meets the comprehensive requirements for performance, connectivity, reliability, and flexibility.

Main features:

Impressive 8x high-performance 2.5 Gigabit Ethernet ports, catering to demanding high-bandwidth and multi-connection scenarios. By eliminating the need for external switches, it optimizes network efficiency. The Intel Ethernet controller, renowned for its stability and advanced feature support, ensures reliable network performance. This technology surpasses traditional 1GbE, offering 2.5 times the bandwidth, resulting in a smoother and more seamless network experience for modern applications.

Flexible expansion capabilities, allowing you to add high-performance network cards, HBAs, and GPU accelerators as needed. It features one PCIe x16 slot operating at x8 speed and one PCIe x8 slot. Additionally, two mPCIe slots (typically used for WiFi/Bluetooth/4G modules) and one M.2 Key-E port (typically used for WiFi modules) provide a wide range of storage and wireless/cellular connectivity expansion options. Multiple serial ports (COM), USB 2.0/3.0, fan connectors, a TPM security module connector, and LAN LED connectors facilitate peripheral device connectivity and status monitoring.

Industrial-grade reliability and durability, ensuring stable operation in a wide range of operating temperatures. It can withstand harsh or non-constant temperature environments, such as factory floors, outdoor cabinets, and non-air-conditioned equipment rooms. Additionally, a wide DC input voltage (12-24V) adapts to unstable power environments, making it compatible with various industrial power adapters or battery backup solutions. A hardware watchdog timer automatically detects system lockups and performs a hard reset, ensuring maximum system continuity. Furthermore, automatic restart after a power outage ensures rapid service recovery, while wake-on-LAN supports remote startup for easy management.

Motherboard Specifications

Processor	Product Collection	Intel Xeon Processor E5 v4 Family
	Sockets Supported	FCLGA2011-3
Memory specifications	Memory Type	DDR4 SO-DIMM
	Maximum Capacity	64GB
	Maximum Frequency	2400 MT/s
Storage specifications	SATA	2*SATA 6Gb/s
	M.2	2*M.2 Key-M (NVMe) SSD
Network features	Ethernet	8*2.5GbE
	Controller	8*Intel I226V
I/O Chip		ITE IT8784E-I
Extension interface	PCIe	1*PCIe x16 (Gen3 x8 rate) 1*PCIe x8 (Gen3)
	mPCIe	1*mPCIe (USB Signal) 1*mPCIe (PCIe Signal is shared with M.2 Key-E)
	M.2	1*M.2 Key-E (PCIe Signal is shared with mPCIe)
Display functions	Pins	1*VGA
	Chip	Based on onboard ASPEED chip
Backplane I/O	USB	4*USB-A 3.0
	COM	1*RJ45 COM-RS232
	LAN	8*RJ45
	Power Supply	1*Jack DC 5.5/2.5mm
Onboard I/O	SATA	2*SATA Data connector/2*SATA Power socket
	USB	1*USB-A 2.0
	Pins	1*F_PANEL

		1*JVGA
		1*JCOM
		1*LPT
		1*TPM
		2*F_USB2.0
	Fan	1*CPU_FAN/4*SYS_FAN
	SIM	1*SIM card slot
	Power	1*ATX 12V~24V 4-pin Connector
Power supply mode	DC	12V~24V
Motherboard size	Specification	287*160(mm)
Work Environment	Temperature	-10℃~60℃;
	Humidity	5%~90% (Relative humidity, no condensation)

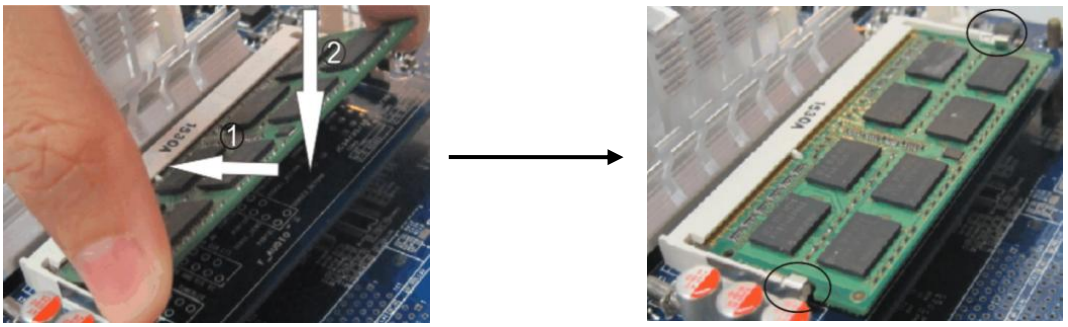
Motherboard Installation

Safety Note

- Please do not remove the serial number and agent warranty sticker from the motherboard prior to installation. Doing so may affect the product's warranty recognition standard.
- Prior to installing or removing the motherboard or other hardware devices, please ensure that the power is turned off and the power cord is unplugged from the socket.
- When installing additional hardware devices on the motherboard interfaces, please ensure that the connectors and sockets are securely fastened.
- When handling the motherboard, please avoid contact with the metal wiring components to prevent the risk of short circuits.
- It is recommended that an anti-static wrist strap be worn when handling the motherboard, central processing unit (CPU), or memory. In the absence of an anti-static wrist strap, it is advisable to ensure that your hands are dry and to touch a metal object first in order to eliminate static electricity.
- Before installing the motherboard, we kindly request that place it on an antistatic mat or in an antistatic bag.
- Make sure the power adapter is turned off before unplugging the motherboard power connector.
- Before turning on the power, make sure the voltage of the adapter is within the standard voltage range.
- Before turning on the power, make sure all hardware device cables and power cords are properly connected.
- Do not allow the fixing screws to collide with the circuits or parts on the motherboard to avoid damage or malfunction of the motherboard.
- Make sure there are no loose screws or metal parts on the motherboard or inside the computer case before using the unit.
- Please secure the computer host in a stable location before starting the device.
- To prevent system failure, do not place the unit in an environment where the temperature is excessive.
- Turning on the power before installation is complete may damage the motherboard, other equipment, or yourself.
- If you are unfamiliar with how to perform the installation, or if you have any technical problems using this product, please contact a professional technician.

Memory Installation

The motherboard provides DDR4 SODIMM memory slot.



Before installing memory:

1. Please confirm that the memory you purchased is compatible with the specifications supported by this motherboard.

2. Before installing or removing the memory, please make sure that the power of the computer is turned off to avoid damage.

3. The memory design has a foolproof mark. If you insert the memory in the wrong direction, the memory cannot be installed. Please change the direction.

When installing memory:

1. Before installing or removing memory, please turn off the power and unplug the power cord.

2. Carefully hold the two ends of the Memory Stick and do not touch the metal contacts on the Memory Stick.

3. Align the metal contacts of the memory with the memory slot, making sure that the concave hole is aligned with the convex point of the upper slot.

4. Insert the memory into the slot at an angle of 30 degrees, then press the Memory Stick down until you hear a "click," indicating that the memory has been successfully installed and is ready to use. (Note: Do not press the Memory Stick too hard to avoid damaging the memory).

5. To remove the Memory Stick, push out the tabs at both ends of the memory slot simultaneously, and then remove the Memory Stick.

To remove the memory:

Use two fingers to push the latches at either end of the slot outward, the memory will pop up, then remove the memory.

Jumper Setting

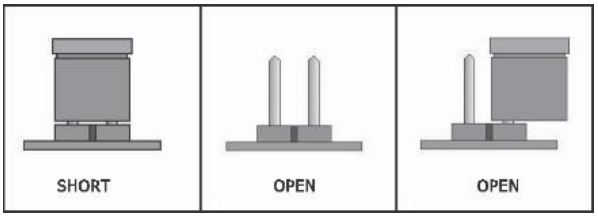
Before installing the hardware device, you can set the corresponding jumpers according to your needs based on the following table.

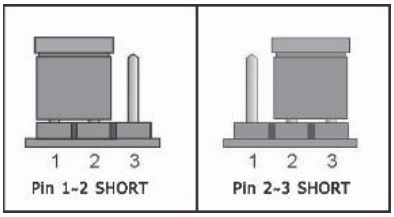
To identify the first pin of a jumper or connector

Look at the marking next to the jumper or connector. The triangle symbol "▲" or "1" or a bold line indicates the first pin; check the pad on the back of the motherboard. The square pad is the first pin. When connecting the connector to the device, be careful to distinguish the first pin. Mixing the pins will damage the motherboard.

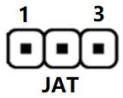
2-pin headers: Insert a jumper cap into both pins turns them off (short).

3-pin headers: Insert a jumper cap into pins 1-2 or pins 2-3 to off (short) them.





Power-on jumper cap: JAT

Image	Status	Setting
	1-2	Enable Automatic Power OnNormal
	2-3	ATX mode (Default)

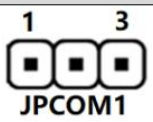
Case open setting: COPEN

Image	Status	Setting
	1-2	System Reset
	2-3	Custom

USB voltage setting: JP1

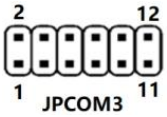
Image	Status	Setting
	1-2	USB3_PWE (Default)
	2-3	+5VSB

COM settings: JPCOM1, JPCOM2

Image	Status	Setting
	1-2	RS232 (Default)
	2-3	RS485

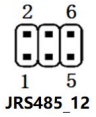
JPCOM3 Settings: JPCOM3

The JPCOM3 jumper is used to set the 9th pin of COM1 and COM2 to be powered.

Image	Status	Setting
	1-2	RS232 COM1
	2-3	5V
	5-6	12V
	7-8	RS232 COM2
	9-10	5V
	11-12	12V

JRS485_12 Settings:

JRS485_12 pins are used to connect COM1 and COM2 for RS485 data signal transmission.

Image	PIN	Definition	PIN	Definition
	1	GND	2	5V
	3	TXDN_1	4	TXDP_1
	5	TXDN_2	6	TXDP_2

Motherboard Pin Definition

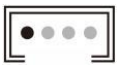
SATA Data

The motherboard provides 7-pin SATA data socket:

Image	PIN	Definition	PIN	Definition
	1	GND	2	SATA_TXP
	3	SATA_TXN	4	GND
	5	SATA_RX-	6	SATA_RXP
	7	GND	-	

SATA PWR

The motherboard provides 4-pin SATA power socket:

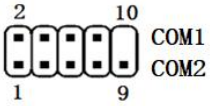
Image	PIN	Definition
	1	+12V
	2	GND
	3	GND
	4	+5V

Serial Port (COM)

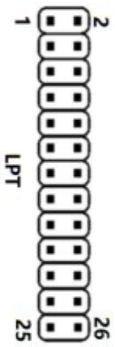
The motherboard provides RJ45 COM port:

Image	PIN	Definition	PIN	Definition
	1	RTS#	2	DTR#
	3	TXD	4	N/A
	5	GND	6	RXD
	7	DSR#	8	CTS#

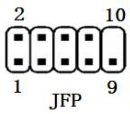
The motherboard provides COM pin (2*5-pin, 2.54mm pitch, 10th pin is empty):

Image	PIN	Definition	PIN	Definition
	1	DCD#	2	RXD
	3	TXD	4	DTR#
	5	GND	6	DSR#
	7	RTS#	8	CTS#
	9	RI#		

Printer interface: LPT

Image	PIN	Definition	PIN	Definition
	1	R_STB	2	R_AFD-
	3	R_PD0	4	R_ERR-
	5	R_PD1	6	R_INIT-
	7	R_PD2	8	R_SLIN-
	9	R_PD3	10	GND
	11	R_PD4	12	GND
	13	R_PD5	14	GND
	15	R_PD6	16	GND
	17	R_PD7	18	GND
	19	R_ACK-	20	GND
	21	R_BUSY	22	GND
	23	R_PE	24	GND
	25	R_SLCT	26	GND

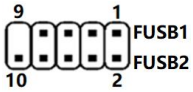
Front panel pin: F_PANEL

Image	PIN	Definition	PIN	Definition
	1	HDD_LED+	2	PWR_LED+
	3	HDD_LED-	4	PWR_LED-
	5	GND	6	GND
	7	RESET	8	PWR_ON
	9	GND		

USB Expansion pin: F_USB

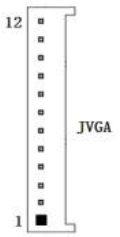
Before connecting the USB expansion board, be sure to turn off the computer and unplug the power cord from the socket to avoid damaging the USB expansion board.

The motherboard provides F_USB pins (2*5-pin, 2.54mm pitch, 9th pin is empty):

Image	PIN	Definition	PIN	Definition
	1	VCC	2	VCC
	3	USB1_DATA-	4	USB2_DATA-
	5	USB1_DATA+	6	USB2_DATA+
	7	GND	8	GND
			10	/

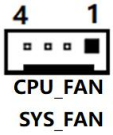
VGA Expansion pin: J_VGA

The motherboard provides J_VGA pins (1*12-pin, 2.00mm pitch):

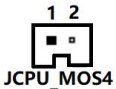
Image	PIN	Definition	PIN	Definition
	1	5V	2	CRT_VSYNC
	3	CRT_HSYNC	4	GND
	5	VGA_R_R	6	GND
	7	VGA_G_R	8	GND
	9	VGA_B_R	10	VGA_DET_N
	11	SDA	12	SCL

System cooling fan power socket: SYS_FAN

The motherboard provides SYS_FAN pins (1*4-pin, 2.54mm pitch):

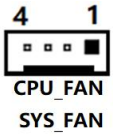
Image	PIN	Definition
	1	Ground
	2	+12V
	3	FAN_TACH
	4	FAN_PWM

The motherboard provides SYS_FAN pins (1*2-pin, 2.54mm pitch):

Image	PIN	Definition
	1	Ground
	2	+12V

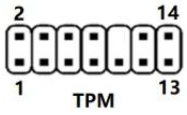
Processor cooling fan power socket: CPU_FAN

The motherboard provides CPU_FAN pins (1*4-pin, 2.54mm pitch):

Image	**PIN**	**Definition**
	1	Ground
	2	+12V
	3	FAN_TACH
	4	FAN_PWM

Trusted Platform Module: TPM

The motherboard provides TPM pins (2*7-pin, 2.00mm pitch):

Image	PIN	Definition	PIN	Definition
	1	TPM_CLK	2	3.3VSB
	3	PLTRST_PCIE_SLOTS_N	4	3.3V
	5	LAD0	6	SER_IRQ
	7	LAD1	8	5V
	9	LAD2	10	NC
	11	LAD3	12	GND
	13	LFRAME#	14	GND

BIOS User Guide

BIOS Description

This motherboard uses AMI BIOS. BIOS stands for (Basic Input Output System). It is a set of programs stored on a ROM (Read Only Memory) chip on the computer's motherboard. It stores the computer's most important basic I/O programs, the power-on self-test program, and the system startup program. It can read and write specific information about system settings from the CMOS. Its primary function is to provide the most basic and immediate hardware settings and control for the computer.

When you turn on your computer, the BIOS is the first program to run. It has the following main functions:

- The Power-On Self-Test (POST) checks whether the computer is functioning properly.
- It initializes and tests some external devices and loads your operating system.
- It provides the lowest-level, most basic control of your computer hardware.
- You manage your computer through the SETUP function in the BIOS.

The BIOS data is stored in a CMOS/R RAM chip on the motherboard, maintained by a 3.3V button battery. It contains important system information and the BIOS Setup program for setting system parameters. When the system is operating normally, the BIOS does not need to be modified. However, if the CMOS data is lost due to other reasons, the BIOS must be reset.

Note:

Incorrect BIOS settings can directly damage the computer hardware and even burn out the motherboard. Those unfamiliar with the system are advised to modify the settings with caution. Because the motherboard BIOS is constantly being updated, the BIOS information in this manual is for reference only. We cannot guarantee that the BIOS information in this manual will be consistent with the actual BIOS information on the motherboard.

BIOS Settings

When the motherboard is powered on or the system is restarted, the following prompt will appear on the display screen in the Post interface. Press "DEL" on the keyboard to enter BIOS Setup.

If this message disappears before you respond, you can press <Ctrl> + <Alt> + <Del> at the same time to restart the computer, or shut down and then restart the computer, or press the power button on the case to restart the computer.

Keyboard keys	Functional Description
← / →	Move the Left and Right arrows to select the screen.
↑ / ↓	Move the Up and Down arrows to select the item.
+ / -	Increase/Decrease value or Change selection
<Enter>	Select, Confirm this option or Enter the submenu
<ESC>	Return to Main page, or End the setup process from Main page
<F1>	Show related Help instructions
<F2>	Restore previous settings
<F9>	Load the optimized settings (BIOS defaults)
<F10>	Save the changed settings and reboot

Common fault analysis and solutions

We have compiled some frequently asked questions for your reference. Please check https://bkminipc.com/frequently-asked-questions-and-answers/

Error	Inspection Method
Unable to start after power on	Make sure the power cord is properly connected. Make sure that the power supply you are using meets the power supply requirements of the motherboard. Try to reinsert the Memory Stick. Try to replace the Memory Stick. Try to clear the CMOS of the main board. Please confirm if there is an external expansion card and if it is normal after removing the external card.
Unable to display after power on	Make sure the monitor is turned on. Make sure the monitor and host power cables are properly connected. Make sure the monitor and host cables are properly connected. Check to see if the monitor is in "Sleep" mode. Try changing the monitor interface or replacing the monitor.
BIOS Setup cannot be saved	Check that the CMOS battery is installed Try to replace the CMOS battery (CR2032) Adjust the time and date in BIOS setup
Unable to find a bootable device	Make sure the drive's power and data cables are properly connected. Make sure the operating system is installed on the drive. Make sure the hard drive is not physically damaged.
Blue screen or freeze when logging on to the system	Check if the Memory Stick and External Card are loose. Try removing the newly installed hardware and uninstalling the newly installed driver or software. Try replacing the memory with a different specification.
Slow entry into the operating system	Check if the CPU cooling fan is running normally. Check if the remaining space of the system partition is insufficient. Use software to check for bad sectors on the hard drive.
System restarts automatically	Confirm that the CPU cooling fan is rotating normally. Confirm that the switch/reset button has not been accidentally touched. Confirm that the Memory Stick and external card are loose. Confirm that the power supply has sufficient load capacity, try to replace the power supply Check if the system is infected with viruses.
Unable to detect USB device	Confirm that the USB device requires separate power. Confirm that the USB interface has poor contact. Confirm that the USB controller is enabled in the BIOS setup.

Useful Links

Submit your suggestions and ideas in the community	https://www.reddit.com/r/bkminipc/	
Watch our new product demos	https://www.youtube.com/@BKHD-PCs	
Corporate News and Cooperation	https://www.linkedin.com/company/beikong/	
Get our latest news on Meta	https://www.facebook.com/people/%E5%80%8D%E6%8E%A7/61558406109357/	

