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BKHD

BKHD-1264-12-2L Motherboard Manual

VER 1.1A

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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.

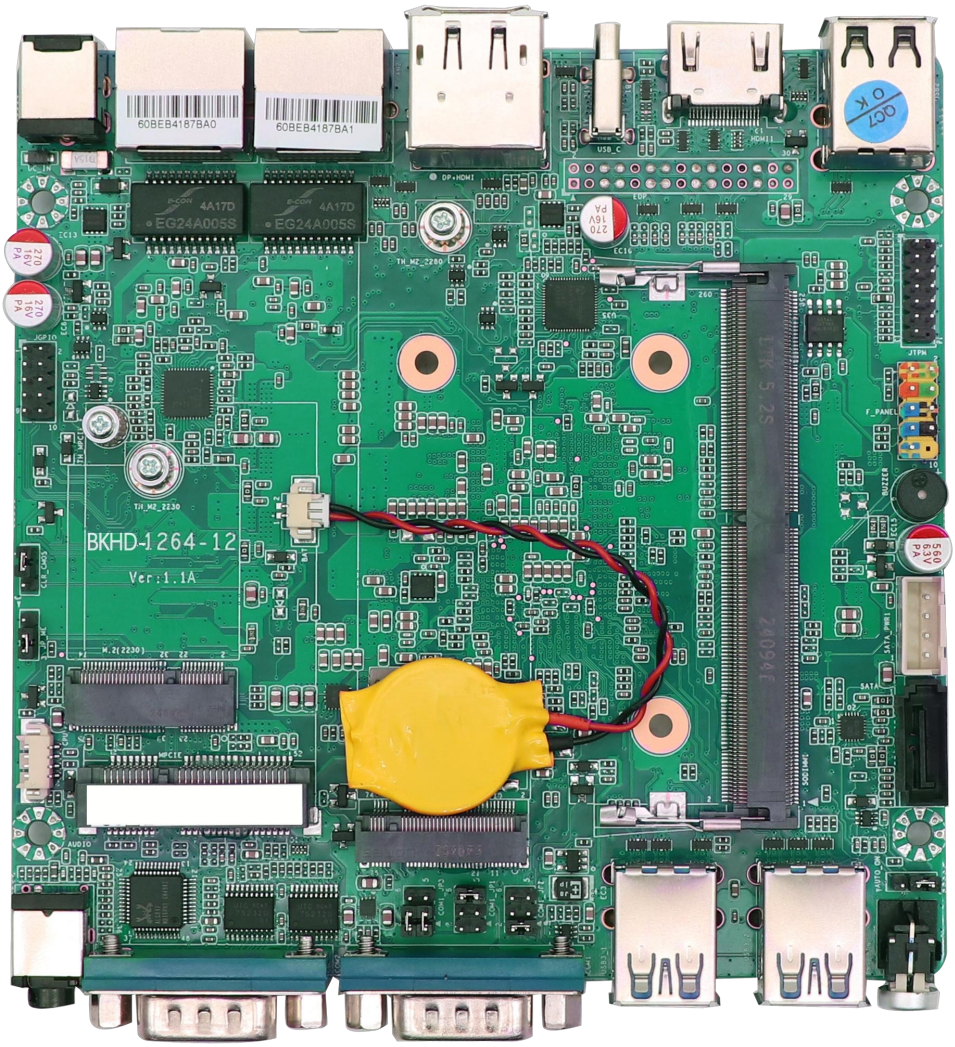
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Product Images

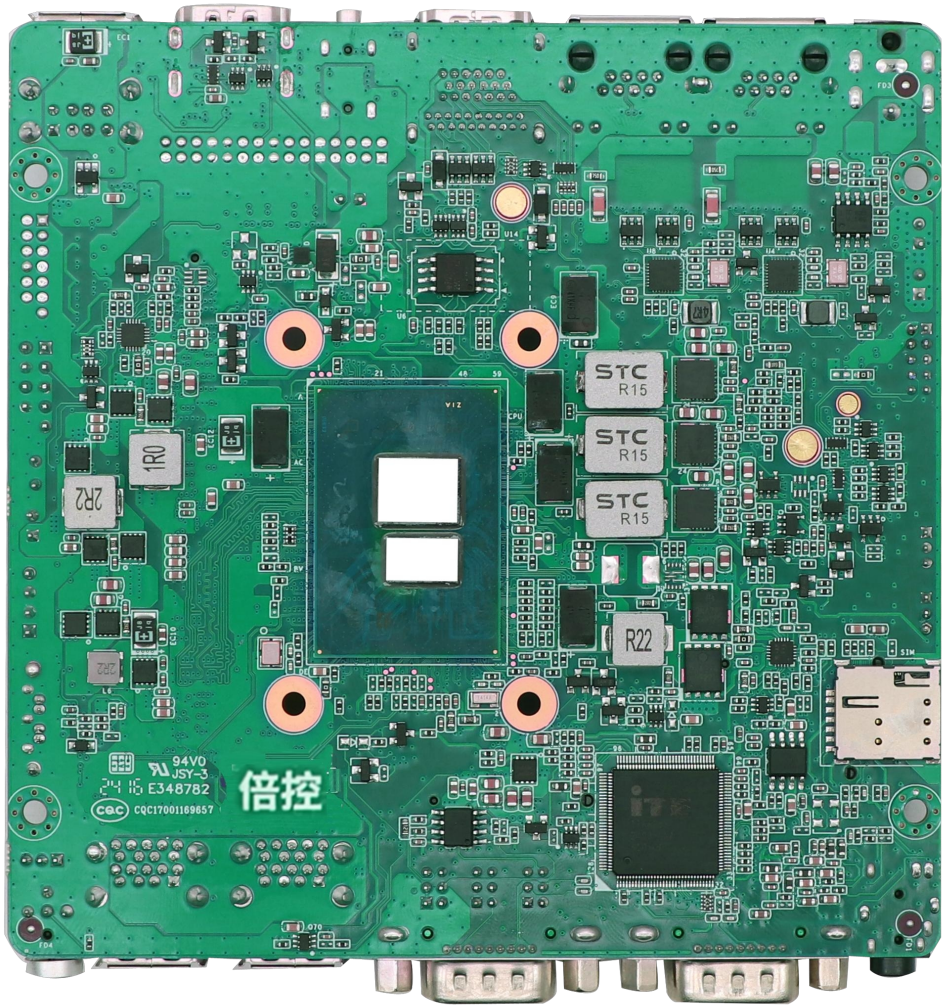
Please be advised that products manufactured in different batches may exhibit slight variations in appearance. To ensure the most accurate representation, please refer to the actual received goods.





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Product Profile

BKHD-1264-12-2L is a compact embedded industrial motherboard based on the Intel Processor N-series platform, designed for industrial control, IoT gateways, digital signage, embedded terminals, and edge computing applications. It integrates low-power processing, dual Gigabit Ethernet, multi-display output, serial communication, and flexible SATA/M.2 storage in a compact form factor. With DDR4 SO-DIMM memory, USB-C support, optional eDP, and rich industrial I/O interfaces, it is well suited for OEM/ODM projects and long-term embedded system deployment.

Main features:

Intel Processor N-series Platform

Built on the Intel Processor N-series platform with FCBGA1264 package. It offers an excellent balance of performance, power efficiency, and stability for embedded and industrial applications.

Flexible Storage Configuration

Provides one SATA 3.0 and one M.2 Key-B+M 2280 supporting PCIe x1 / SATA 3.0 slot. This allows flexible storage deployment for operating systems, application data, logging, or local caching.

Dual Gigabit Ethernet

Equipped with dual ports RJ45 Gigabit Ethernet powered by Realtek 8111 controllers, the board supports industrial networking, gateway communication, device management, and network separation applications.

Rich Display Output

Supports multiple display outputs: 1x DisplayPort, 2x HDMI, 1x USB-C display output; Optional eDP pins. This makes it suitable for HMI panels, digital signage, interactive terminals, and multi-display embedded systems.

Industrial Serial Communication

The backplane includes 1x DB9 COM RS232/RS485 and 1x DB9 COM RS232. These ports support connection to PLCs, sensors, meters, barcode scanners, controllers, and other industrial serial devices.

Wireless and Expansion Options

The board includes: 1x mPCIe slot, 1x M.2 Key-E 2230 (CNVi), 1x SIM card slot These interfaces support wireless communication modules, Wi-Fi, BT, and project-specific expansion depending on configuration.

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Motherboard Specifications

Processor	Product Collection	Intel Processor N-series
	Sockets Supported	FCBGA1264
Memory specifications	Memory type	DDR4 SO-DIMM
	Maximum capacity	16GB
	Maximum frequency	3200 MT/s
Storage specifications	SATA	1*SATA 3.0 (6Gb/s)
	M.2	1*M.2 Key-B+M 2280 (PCIe x1/SATA 3.0)
Network features	Ethernet	2*1GbE
	Controller	2*Realtek 8111
Extension interface	mPCIe	1*mPCIe
	M.2	1*M.2 Key-E 2230 (CNVi)
Display functions	Port	1*DP/2*HD/1*USB-C
	Chip	Intel UHD Graphics
Backplane I/O	Ethernet	2*RJ45
	COM	1*DB9 COM RS232/RS485, 1*DB9 COM RS232
	Power supply	1*Jack DC 5.5/2.5mm
	Display	1*DP/2*HD
	USB	4*USB-A 3.0, 2*USB-A 2.0, 1*USB-C
	Audio	1*Jack Audio
	Button	1*Power Button
Onboard I/O	SATA	1*SATA Data connector/1*SATA Power socket
	SIM	1*SIM Card solts
	Fan	1*CPU fan power socket
	Pins	1*F_PANEL
		1*J_GPIO
		1*J_TPM
		1*eDP (Optional)
Power supply mode	DC	12V
Motherboard size	Specification	121.6*121.6 (mm)
Work Environment	Temperature	-20~55℃
	Humidity	5%~90% (Relative humidity, no condensation)

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Motherboard Installation

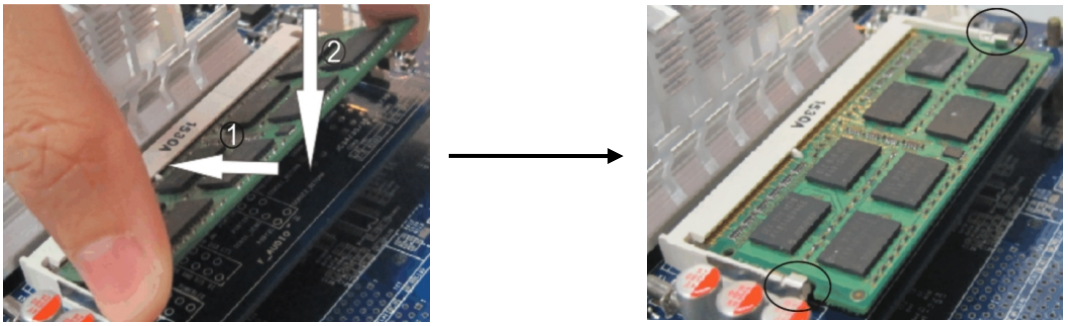
Safety Note

- 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.

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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.

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Jumper Setting

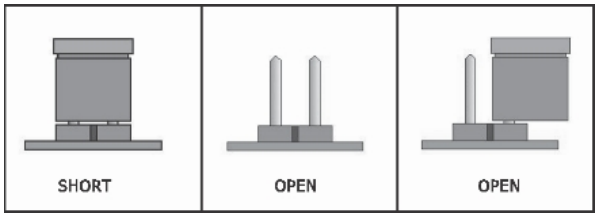
Before installing the hardware device, you can set the corresponding jumpers according to your needs based on the following table.

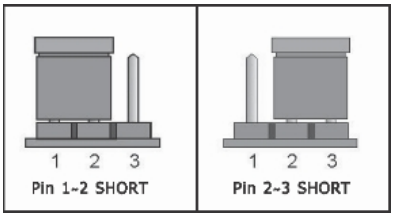
To identify the first pin of a jumper or connector

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.





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Clear CMOS Jumper Setting (CLR_CMOS)

Image	Status	Setting
	1-2	Normal (Default)
	2-3	Restore BIOS to default settings

Before clearing the CMOS, please turn off the device and disconnect the power to avoid damaging the motherboard.

Restore on AC/Power Loss (AUTO_ON)

Image	Status	Setting
	1-2	Automatic power on
	2-3	Normal (Default)

ME Flashing Selection Jumper (JME)

Image	Status	Setting
	1-2	Disable
	2-3	Enable (Default)

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Motherboard Pin Definition

SATA Data

The motherboard provides SATA data socket

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

SATA PWR

The motherboard provides SATA power socket (1*4-pin, 2.54 mm pitch)

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

Tip: The 1st pin of the SATA_PWR hard disk power supply interface is +12V output, and the 4th pin is +5V output.

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Serial Port (DB9 COM)

The motherboard provides DB9 connector, with COM1 adjustable for RS485

Status RS232

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

Status RS485

Image	PIN	Definition	PIN	Definition
	1	DATA-	2	DATA+
	3	N/C	4	N/C
	5	GND	6	N/C
	7	N/C	8	N/C
	9	N/C		

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COM Status Adjustment Jumper (JP1/JP2/JP3)

The motherboard provides Jumper for switching between RS232 and RS485 on COM1. The default transmission mode is RS232.

COM1_JP2 (1*3-pin, 2.00 mm pitch)

Image	Status	Setting
	1-2	RS-232 (Default)
	2-3	RS-485

COM1_JP3 (2*3-pin, 2.00 mm pitch)

Image	Status	Definition
	1-3, 2-4	RS-232 (Default)
	3-5, 4-6	RS-485

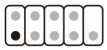
COM1_JP1 (2*3-pin, 2.00 mm pitch)

Image	Status	Definition
	1-2	+5V
	3-4	+12V
	5-6	RI# (Default)

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Front Panel Connectors (F_PANEL)

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

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		

General-Purpose Input/Output Pins (GPIO)

The motherboard provides GPIO pins (2*5-pin, 2.00 mm pitch)

Image	PIN	Definition	PIN	Definition
	1	GND	2	VCC
	3	GPIO 1	4	GPIO 5
	5	GPIO 2	6	GPIO 6
	7	GPIO 3	8	GPIO 7
	9	GPIO 4	10	GPIO 8

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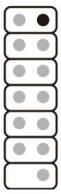
Cooling Fan Power Socket (CPU_FAN)

The motherboard provides CPU fan power socket (1*4-pin)

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

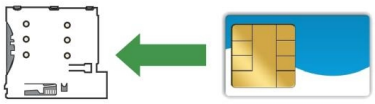
Trusted Platform Module (J_TPM)

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

Image	PIN	Definition	PIN	Definition
	1	+3.3V	2	IRQ#
	3	PLTRST#	4	SPI0_CS2#
	5	SPI0_CS1#	6	WP#
	7	+3.3V	8	GND
	9	SPI0_CS#	10	SPI0_CLK
	11	SPI0_MISO	12	SPI0_MISI
	13	HOLD#	14	

SIM card slot (SIMB)

The motherboard provides SIM card slot for installing an LTE SIM card, Located on the back of the motherboard.



Note: When inserting the SIM card, make sure the chip is facing downwards (the chip faces the motherboard).

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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.

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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

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Common fault analysis and solutions

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

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.

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Useful Links

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Watch our new product demos	https://www.youtube.com/@BKHD-PCs	
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