



NUC18D User Manual

Issue 1.0

www.CoreIPC.com

Security Guidance

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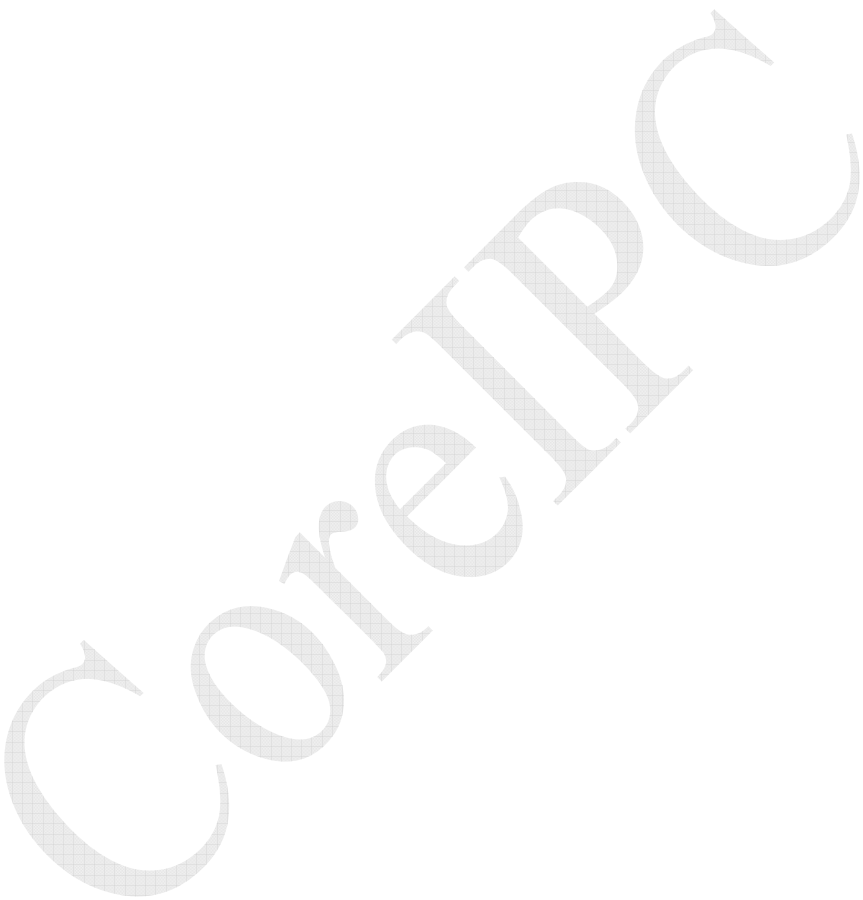
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- The contents of this user manual may not be reproduced, modified, reprinted, distributed, or published in any form without prior written permission from CoreIPC.
- To help you use the CoreIPC motherboard, please read the [User Manual] carefully.
- 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.

Ordering Information

No.	Model	CPU	Cores	Freq.	Memory	HDMI	VGA	LVDS	EDP	LAN	USB	PS2	LPT	COM/485	POWER
1	NUC18D-L12 VER1.0	J1900	4	2.0G	DDR3L	1	1	1	/	1	6	/	/	2 / 1	12V
2	NUC18D-L22 VER1.0	J1900	4	2.0G	DDR3L	1	1	1	/	2	6	/	/	2 / 1	12V



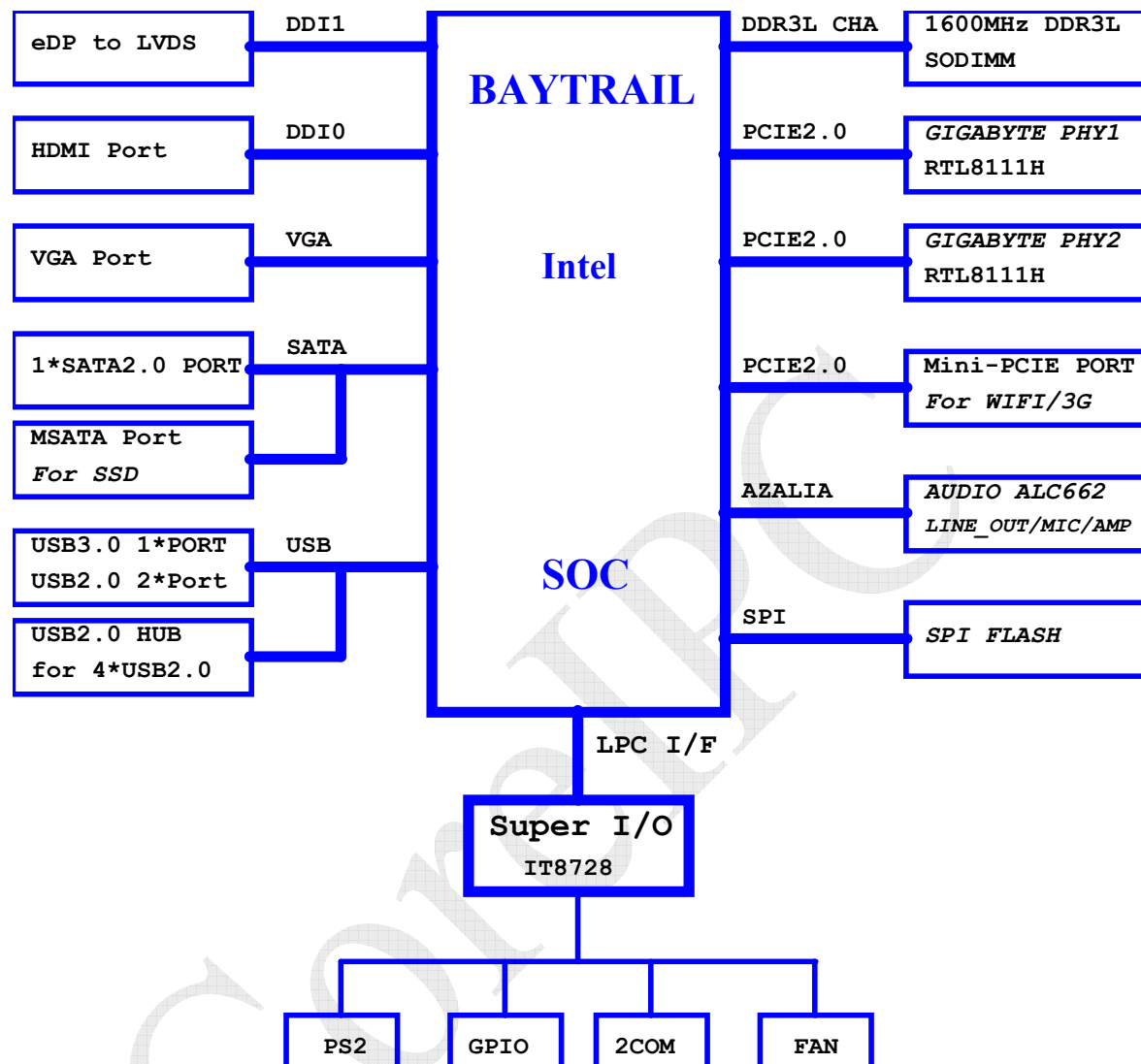
1. Product Description

NUC18D is a CoreIPC NANO-series motherboard supporting Intel® Bay Trail-I/M/D series processors. It is suitable for commercial displays, medical instruments, industrial control, financial equipment, cloud terminals, and other applications.

The main features of the NUC18D motherboard are as follows:

- Supports Intel® Bay Trail-I/M/D series processors;
- Supports single-channel 1600/1333 MHz DDR3L 1.35 V memory, up to 8 GB;
- Supports VGA, HDMI, and LVDS display outputs;
- Supports up to 2 Gigabit Ethernet ports;
- Supports 1 × Mini PCIe slot for Wi-Fi/4G and 1 × mSATA slot;
- Supports up to 6 USB ports;
- Provides 2 onboard RS232 serial ports; COM2 optionally supports RS485;
- Fanless cooling supports a sealed system design for improved dust and moisture resistance;
- Supports a wide operating temperature range of -20°C to 60°C;
- Supports AT/ATX mode switching and 12 V DC power input.

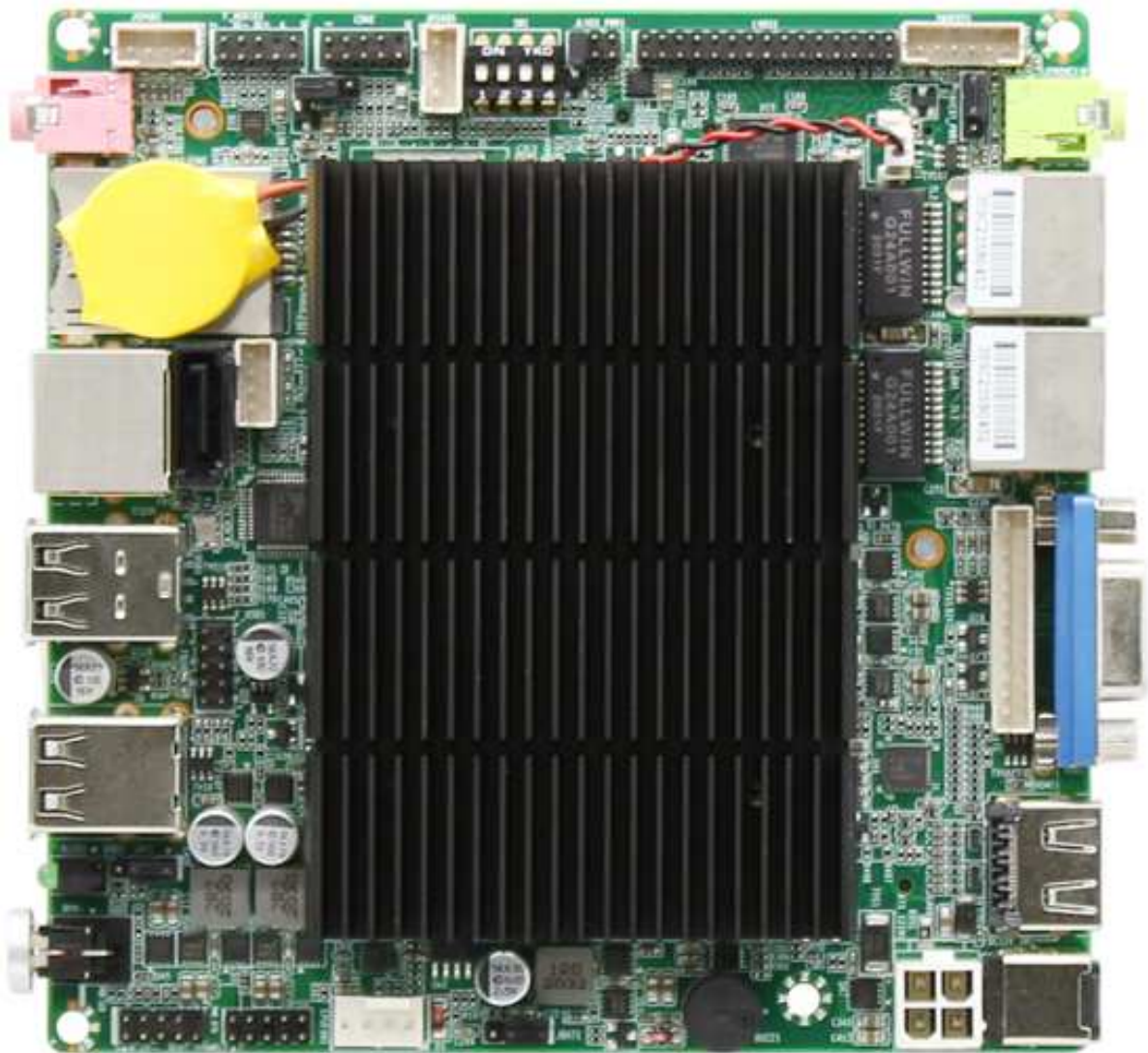
2. Motherboard Block Diagram



3. Motherboard Specifications

Item	Description
Processor	Integrated Intel® Celeron® J1900 2.0 GHz quad-core processor Compatible with Intel® Bay Trail-I/M/D series processors
Memory	1 × SO-DIMM slot; supports single-channel 1600/1333 MHz DDR3L 1.35 V memory, up to 8 GB
Display	Integrated Intel® HD Graphics
	1 × VGA, 1 × HDMI, and 1 × LVDS interface
	Supports synchronous/asynchronous VGA, HDMI, and LVDS display
Network	2 × Realtek RTL8111H Gigabit Ethernet controllers; supports Wake-on-LAN and PXE boot
Storage	1 × SATA interface
	1 × mSATA slot
Audio	Onboard ALC662 6-channel HD audio controller; supports MIC, Line-out, and 3 W amplifier output
Expansion Slots	1 × Mini PCIe slot supporting half-size and full-size cards for Wi-Fi/4G modules
Rear I/O	1 × HDMI display interface
	1 × VGA display interface
	2 × RJ-45 Gigabit Ethernet ports (LAN2 and USB 2.0 are mutually exclusive)
	1 × Line-out jack (green)
	1 × 12 V DC power input
Front I/O	3 × USB 2.0 ports and 1 × USB 3.0 port
	1 × COM port (RJ-45)
	1 × MIC jack (red)
	1 × SIM slot
	1 × HDD LED
	1 × illuminated power button
Internal I/O	1 × 4-pin ATX power connector, usable as a 12 V input/output power connector
	2 × USB 2.0 ports via a 2 × 5-pin header (mutually exclusive with the rear-panel USB ports)
	1 × 1 × 12-pin JVGA header (same signals as DB15)
	1 × 2 × 5-pin front-audio header
	1 × 1 × 4-pin amplifier connector
	1 × 2 × 5-pin COM header (optional RS485 support)
	1 × drive power connector

	1 × 2 × 5-pin front-panel switch and LED header
Fan Connectors	Fanless thermal design with 1 × 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 7/Windows 10/Linux
Power Type	Powered by 12 V DC ±5%
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 NUC18D-L22 VER1.0. Other models may differ.

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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 × 204-pin DDR3L 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.

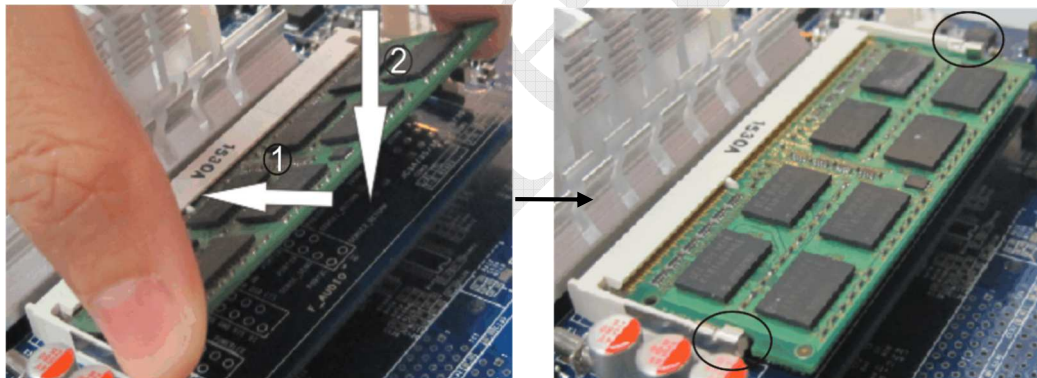
Memory Installation Steps:

- 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.

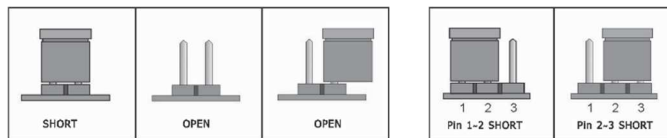


5. Jumper Settings

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: 2.54 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: 2.54 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 (default)
Enable Auto Power-on	2-3Pin

6. Pin Definitions

6.1. The motherboard provides 2 × 2 × 5-pin standard COM headers (2.0 mm pitch).

JCOM1 and COM1 are mutually exclusive, and JCOM1 is not populated by default.

The standard pin definitions of JCOM1 and COM2 are as follows:

Pin	Signal Name	Pin	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

The motherboard provides 1 × standard Cisco-type COM1 port. JCOM1 and COM1 are mutually exclusive; COM1 is provided by default.

The standard COM1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	RTS	2	DTR
3	TXD	4	GND
5	GND	6	RXD
7	DSR	8	CTS

COM2 RS232/RS485 selection jumper — JC1 settings:

Port	JC1 Setting	Function	Remarks
COM2	Pins 1–2 shorted	RS232	COM2 RS485 signals are provided on the 1 × 4-pin RS485 header: Pin 2 is COM A and Pin 3 is COM B.
	Pins 2–3 shorted	RS485	

The motherboard provides 1 × 1 × 4-pin RS485 header (2.0 mm pitch). The JRS485 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	GND	2	TXD-(B)
3	TXD+(A)	4	+5V

6.2. The motherboard provides 1 × 2 × 15-pin LVDS header (2.0 mm pitch). The LVDS1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	LCDVDD	2	LCDVDD
3	LCDVDD	4	NC
5	GND	6	GND
7	LVDS_A0-	8	LVDS_A0+
9	LVDS_A1-	10	LVDS_A1+
11	LVDS_A2-	12	LVDS_A2+
13	GND	14	GND
15	LVDSA_CLK-	16	LVDSA_CLK+
17	LVDS_A3-	18	LVDS_A3+
19	LVDS_B0-	20	LVDS_B0+
21	LVDS_B1-	22	LVDS_B1+
23	LVDS_B2-	24	LVDS_B2+
25	GND	26	GND

27	LVDSB_CLK-	28	LVDSB_CLK+
29	LVDS_B3-	30	LVDS_B3+

The board provides 3.3 V, 5 V, and 12 V LCD operating-voltage options, as well as 5 V and 12 V backlight power options.

Before using LVDS, confirm the rated operating voltage required by the LCD panel. The panel will operate correctly only when the selected LCD voltage matches the panel voltage. Configure it as follows:

INVERT1 (Backlight Power Connector) Definition:

Pin	Signal Name
1	12 V / 5 V (set by INVERT_PWR1)
2	12 V / 5 V (set by INVERT_PWR1)
3	Backlight Enable
4	Backlight Brightness Control
5	GND
6	GND

INVERT_PWR1 (LCD Backlight Power) Settings:

Interface	Function	INVERT_PWR1 Setting
LVDS1	12 V (default)	1-2Pin
	5V	2-3Pin

LVDS_PWR1 (LCD Operating Voltage) Settings:

Interface	Function	INVERT_PWR1 Setting
LVDS1	3.3 V (default)	1-2Pin
	5V	3-4Pin
	12V	5-6pin

The motherboard provides 1 × SW1 DIP switch for setting the LVDS resolution. The detailed settings are as follows:

No.	DIP Switch Setting	Resolution / Bit Depth	No.	DIP Switch Setting	Resolution / Bit Depth	No.	DIP Switch Setting	Resolution / Bit Depth
1		800 × 600, single-channel 6-bit	2		1024 × 768, single-channel 6-bit	3		1280 × 768, single-channel 6-bit
4		1280 × 800, single-channel 6-bit	5		1280 × 960, single-channel 6-bit	6		1280 × 1024, dual-channel 8-bit

7		1366 × 768, single-channel 6-bit	8		1366 × 768, single-channel 8-bit	9		1440 × 900, dual-channel 8-bit
10		1024 × 600, single-channel 6-bit	11		1920 × 1080, dual-channel 6-bit, 15.6-inch	12		1920 × 1080, dual-channel 8-bit, 21.5-inch
13		1920 × 1080, dual-channel 8-bit, 42-inch	14		1280 × 1024, dual-channel 8-bit	15		1280 × 800, single-channel 8-bit
16		1024 × 768, single-channel 8-bit	17			18		

6.3. The motherboard provides 1 × 1 × 12-pin JVGA1 connector (2.0 mm pitch), sharing the same signals as VGA1.

JVGA1 Definition:

Pin	Signal Name	Pin	Signal Name
1	NC	2	VSYNC
3	HSYNC	4	GND
5	R	6	GND
7	G	8	GND
9	B	10	GND
11	DDC_SDA	12	DDC_SCL

6.4. The motherboard provides 1 × 2 × 5-pin front-audio header (2.0 mm pitch). The F_AUDIO1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	MIC-L	2	GND
3	MIC-R	4	NC
5	Line out-R	6	Sense Return1
7	GND	8	NC
9	Line OUT-L	10	Sense Return2

6.5. The motherboard provides 1 × 1 × 4-pin 3 W amplifier connector (2.0 mm pitch).

The JSPKR1 pin definition is as follows:

Pin	Signal Name
1	SPKL-
2	SPKL+
3	SPKR-

4	SPKR+
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6.6. The board provides 1 × 1 × 4-pin SATA drive power connector (2.0 mm pitch). The JSPWR1 pin definition is as follows:

Pin	Signal Name
1	+12V
2	GND
3	GND
4	+5V

Be sure to verify the position of Pin 1 on JSATA_PWR1; an incorrect connection may damage the drive. Use the power cable supplied by CoreIPC.

6.7. The motherboard provides 1 × 2 × 5-pin USB 2.0 header (2.0 mm pitch). F_USB1 and USB1 are mutually exclusive. F_USB1 provides USB 2.0 functionality only on the dual-LAN version.

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

6.8. The board provides 1 × 1 × 4-pin fan connector. The CPUFAN1 pin definition is as follows:

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

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

6.9. The board provides 1 × 2 × 5-pin FPANEL1 header (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	

6.10. The motherboard provides 1 × 2 × 5-pin GPIO header (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

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