

CoreIPC

NUC-100

120 x 120 mm Industrial NUC Motherboard Datasheet

Intel® Alder Lake-N Platform

Document	Datasheet
Model	NUC-100
Issue	1.1
Product Type	120 x 120 mm Industrial NUC Motherboard
Website	www.CoreIPC.com

This datasheet is prepared based on NUC-100 User Manual Issue 1.1.

1. Product Overview

The NUC-100 is a compact 120 x 120 mm NANO multi-LAN industrial motherboard designed for Intel® Alder Lake-N series processors. It combines dual Gigabit Ethernet, DDR5 memory, multiple display outputs, M.2 and Mini PCIe expansion, serial interfaces, GPIO, and fanless thermal design for software routers, network security, industrial control, cloud terminals, and related embedded computing applications.

2. Key Features

- Supports Intel® Alder Lake-N series processors; the ordering table lists N95, N100, N200, i3-N305, N150, N250, N350, and N355 configurations.
- 1 x SO-DIMM slot supporting single-channel DDR5-4800 memory, up to 16 GB.
- Display support includes 2 x HDMI, 1 x DP, and 1 x USB Type-C, with the source specification stating up to 4K @ 60 Hz on the listed display outputs.
- 2 x Realtek Gigabit Ethernet ports with Wake-on-LAN and PXE support.
- Storage includes 1 x SATA 3.0 connector and 1 x M.2 Key-M 2280 slot with PCIe/SATA auto-adaptive SSD support.
- Wireless expansion includes 1 x M.2 Key-E slot, 1 x M.2 Key-B slot, and 1 x Mini PCIe slot; 4G and 5G share one SIM card slot.
- USB connectivity includes 2 x USB 3.1, 4 x USB 2.0, and 1 x USB Type-C port with up to 10 Gbps data rate.
- 2 x DB9 RS232 ports by default; COM1 and COM2 can be configured for RS485 through jumper settings.
- Onboard Realtek ALC897 7.1-channel HD audio supporting MIC and Line-out; Type-C also supports audio according to the source manual.
- Fanless 120 x 120 mm design with 12 V DC input, GPIO, reserved TPM 2.0 interface, watchdog, and operating temperature from -10°C to 60°C.

3. Technical Specifications

Category	Specification
CPU	Intel® Alder Lake-N series processors. Source ordering options: N95, N100, N200, i3-N305, N150, N250, N350, and N355.
Memory	1 x SO-DIMM slot; single-channel DDR5-4800; up to 16 GB.
Graphics / Display	Integrated Intel® UHD Graphics. 2 x HDMI, 1 x DP, and 1 x USB Type-C display interface; source manual states up to 4K @ 60 Hz.
Ethernet	2 x Realtek Gigabit Ethernet controllers; Wake-on-LAN and PXE support.
Storage	1 x SATA 3.0 connector, up to 6 Gbps; 1 x M.2 Key-M 2280 slot with PCIe/SATA auto-adaptive SSD support.
Audio	Onboard Realtek ALC897 7.1-channel HD audio; MIC and Line-out support.
Expansion	1 x M.2 Key-E for Wi-Fi/Bluetooth; 1 x M.2 Key-B for 5G; 1 x Mini PCIe for Wi-Fi/BT/4G. 4G and 5G share one SIM card slot.
USB	2 x USB 3.1 ports; 4 x USB 2.0 ports; 1 x USB Type-C with up to 10 Gbps data rate, display output, and audio.
Serial Ports	2 x DB9 RS232 ports by default; COM1 and COM2 support RS485 through jumper settings.
GPIO	1 x 2 x 5-pin GPIO header supporting 4-channel GPIO input/output.
TPM	Reserved onboard TPM 2.0 interface.
BIOS	128 Mb Flash ROM.
Watchdog	Hardware reset watchdog; 256 levels, 0-255 seconds.
OS Support	Windows 10 / Windows 11 / Linux.
Power	12 V DC input; AT/ATX power mode selection supported.
Operating Temperature	-10°C to 60°C.
Storage Temperature	-20°C to 70°C.
Operating Humidity	5%-95% RH, non-condensing.
Dimensions	120 mm x 120 mm.

4. I/O Interface Summary

4.1 External I/O

Interface	Description
Display	2 x HDMI; 1 x DP; 1 x USB Type-C display interface. One single-layer HDMI can be BOM-configured to support dual DP according to the source manual.
USB	Rear: 2 x USB 2.0 + 1 x USB Type-C. Front: 2 x USB 3.1 + 2 x USB 2.0.
LAN	2 x RJ-45 Gigabit Ethernet ports.
Serial	2 x DB9 RS232 ports by default; COM1/COM2 support RS485 via jumper settings.
Audio	1 x 3.5 mm audio jack supporting Line-out and MIC; Type-C also supports audio.
Power	1 x 12 V DC input connector and power button/LED indicators.

4.2 Internal I/O and Headers

Interface / Header	Description
GPIO	1 x 2 x 5-pin GPIO header; supports 4-channel input/output.
Front Panel	1 x 2 x 5-pin front-panel header for power button, reset, HDD LED and power LED.
SATA Power	1 x red 1 x 4-pin SATA HDD power connector.
TPM	Reserved onboard TPM 2.0 interface.
Fan	1 x optional 4-pin CPU fan connector; board is designed for fanless thermal operation.
Wireless / Cellular	M.2 Key-E, M.2 Key-B, Mini PCIe, and shared SIM-card resources as specified in the source manual.

5. Display Support

The NUC-100 source manual lists two HDMI interfaces, one DP interface, and one USB Type-C display interface. It states that all listed display interfaces support up to 4K @ 60 Hz and that synchronous/asynchronous multi-display operation is supported via HDMI1, DP, and Type-C.

Item	Description
Integrated Graphics	Intel® UHD Graphics.
HDMI	2 x HDMI display interfaces; source manual states up to 4K @ 60 Hz.
DisplayPort	1 x DP display interface; source manual states up to 4K @ 60 Hz.
USB Type-C	1 x Type-C supporting display output, USB up to 10 Gbps, and audio.
Multi-display	Source manual states synchronous/asynchronous display via HDMI1, DP, and Type-C.

6. Serial Port Configuration

Port	Default / Optional Function
COM1	RS232 by default; RS485 available through jumper settings.
COM2	RS232 by default; RS485 available through jumper settings.
Connector	2 x standard DB9 serial ports with 2.0 mm pin pitch.
RS485	COM1 and COM2 RS485 modes are selected through JRS485_SW1/JRS485_SW2 and JC1 jumper settings.

7. Power, Cooling and Reliability Functions

Item	Description
Main Power	12 V DC input.

Item	Description
AT / ATX Mode	AT/ATX power mode selection through AT-ATX1 jumper; auto power-on can be enabled or disabled.
Thermal Design	Fanless thermal design with rear-mounted CPU heatsink.
Optional CPU Fan	1 x optional 4-pin CPU fan connector with GND, +12 V, DET and PWM.
Watchdog	Hardware reset watchdog; 256 levels, 0-255 seconds.

8. Mechanical and Environmental Information

Item	Description
Form Factor	Compact industrial NUC motherboard.
Dimensions	120 mm x 120 mm.
Cooling	Fanless design with rear-mounted CPU heatsink; optional CPU fan connector reserved.
Operating Temperature	-10°C to 60°C.
Storage Temperature	-20°C to 70°C.
Operating Humidity	5%-95% RH, non-condensing.

9. Ordering Information

Model	Description
NUC-100-N95	N95; 4 cores; up to 3.4 GHz; 15 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N100	N100; 4 cores; up to 3.4 GHz; 6 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N200	N200; 4 cores; up to 3.7 GHz; 6 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-i3-N305	i3-N305; 8 cores; up to 3.8 GHz; 15 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N150	N150; 4 cores; up to 3.6 GHz; 6 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N250	N250; 4 cores; up to 3.8 GHz; 6 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N350	N350; 8 cores; up to 3.9 GHz; 7 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.
NUC-100-N355	N355; 8 cores; up to 3.9 GHz; 15 W TDP; DDR5; 2 HDMI; 1 DP; 1 Type-C; 2 LAN; 7 USB; 2 COM / 2 RS485; 12 V.

10. Compliance and Documentation Notes

- Certification and compliance information is not specified in the source manual. Contact CoreIPC for project-specific certification or compliance documentation.
- Memory specification is consistent in the revised source manual: 1 x DDR5 SO-DIMM slot, single-channel DDR5-4800, up to 16 GB.
- Platform identification is consistent in the revised source manual: Intel® Alder Lake-N series.

11. Contact Information

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Disclaimer: This datasheet was compiled from NUC-100 User Manual Issue 1.1. Product specifications, interface counts, processor options, and optional functions may vary by production configuration. Please confirm the selected configuration before order placement. All product names, trademarks and registered trademarks are the property of their respective owners.