

CoreIPC

NUC32R

120 x 120 mm Quad-LAN Industrial NUC Motherboard Datasheet

Intel® Alder Lake-N / Twin Lake-N Platform

Document	Datasheet
Model	NUC32R
Issue	1.1A
Product Type	120 x 120 mm Quad-LAN Industrial NUC Motherboard
Website	www.CoreIPC.com

This datasheet is prepared based on NUC32R User Manual Issue 1.1A.

1. Product Overview

The NUC32R is a compact 120 x 120 mm CoreIPC NANO-series quad-LAN motherboard supporting Intel® Alder Lake-N and Twin Lake-N processors. It integrates DDR4 memory, HDMI and DisplayPort, four Intel® 2.5GbE ports, SATA and M.2 storage, Mini PCIe expansion, USB and serial connectivity, TPM 2.0, GPIO, and 12 V DC input for soft routers, network security systems, industrial control, cloud terminals, and other embedded applications.

2. Key Features

- Supports Intel® Alder Lake-N / Twin Lake-N processors. Ordering Information lists N95, N100, N200, Core™ i3-N305, N150, and N250 variants.
- DDR4-3200 SO-DIMM memory, up to 32 GB. Product Description and detailed specifications list 1 x SO-DIMM; the Memory Installation section states 2 x 260-pin SO-DIMM slots.
- 1 x HDMI + 1 x DisplayPort, both supporting up to 4K @ 60 Hz; synchronous/asynchronous dual-display output.
- 4 x Intel® I225-V / I226 2.5GbE ports with Wake-on-LAN and PXE boot support.
- 1 x SATA 3.0 connector plus 1 x M.2 Key M 2280/2242 slot supporting PCIe/SATA auto-detection. The SATA connector is mutually exclusive with the mSATA signal described for the Mini PCIe option.
- 1 x Mini PCIe slot supporting 4G and Wi-Fi by default; mSATA support is available through hardware modification.
- 2 x USB 3.1 plus multiple USB 2.0 interfaces, including optional USB Type-C (USB 2.0). USB 2.0 resources are shared with the 4G module, Type-C port, and internal header.
- 2 x DB9 RS232 ports by default. COM1 can optionally support RS485 through hardware modification; COM2 can optionally be configured as a console port.
- TPM 2.0 header, 4-channel GPIO, hardware watchdog, optional auto power-on DIP switch, and AT/ATX power-mode selection.
- 120 x 120 mm form factor; 12 V DC input; fanless thermal design; operating temperature -10°C to 60°C.

3. Technical Specifications

Category	Specification
Processor	Intel® Alder Lake-N / Twin Lake-N processors. Source ordering table lists N95, N100, N200, Core™ i3-N305, N150 and N250.
Memory	DDR4-3200 SO-DIMM, up to 32 GB. Main specifications list 1 x SO-DIMM; Memory Installation states 2 x 260-pin SO-DIMM slots.
Graphics / Display	Integrated Intel® UHD Graphics; 1 x HDMI 1 (4K @ 60 Hz) + 1 x DisplayPort (4K @ 60 Hz); synchronous/asynchronous dual display.
Ethernet	4 x Intel® I225 / I226 2.5GbE controllers with Wake-on-LAN and PXE support.
Storage	1 x SATA 3.0, up to 6 Gbps; 1 x M.2 Key M 2280/2242 supporting PCIe/SATA auto-detection SSDs.
Expansion	1 x Mini PCIe slot supporting 4G and Wi-Fi by default; hardware modification can enable mSATA support.
USB	2 x USB 3.1 plus USB 2.0 interfaces. Optional USB Type-C supports USB 2.0 only; internal USB resources are shared with 4G/Type-C.
Serial Ports	2 x DB9 RS232 by default. COM1 optional RS485 requires hardware modification; COM2 optional console port shares COM2 signal.
TPM	1 x 2 x 6-pin TPM 2.0 header.
GPIO	4-channel GPIO input/output.
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.
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 Rear Panel I/O

Interface	Description
LAN	4 x RJ45 2.5GbE ports.
Display	1 x stacked HDMI + DisplayPort connector.
USB	2 x USB 2.0 rear ports.
Power	1 x 12 V DC input connector.

4.2 Internal I/O and Headers

Interface / Header	Description
Front USB	2 x USB 3.1 + 2 x USB 2.0 front I/O ports.
USB 2.0 Header	1 x 2 x 5-pin F_USB1. Signals are shared with the 4G module and optional USB Type-C port.
USB Type-C	1 x optional USB Type-C port supporting USB 2.0; mutually exclusive with one F_USB1 signal.
Serial	2 x DB9 RS232 front ports; 1 x optional JCOM2 header sharing the same signal as COM2.
TPM	1 x 2 x 6-pin TPM 2.0 header.
GPIO	1 x 2 x 5-pin GPIO header.
Storage Power	1 x SATA drive power connector.
Front Panel	1 x 2 x 5-pin front-panel switch / LED header.
Fan	1 x reserved 4-pin CPU fan header.
DC Power	1 x 4-pin white power connector.

5. Display Support

NUC32R provides a stacked HDMI + DisplayPort connector. The source manual specifies both HDMI and DisplayPort at up to 4K @ 60 Hz and supports synchronous or asynchronous dual-display output.

Item	Description
Integrated Graphics	Intel® UHD Graphics.
HDMI	1 x HDMI output supporting up to 4K @ 60 Hz.
DisplayPort	1 x DisplayPort output supporting up to 4K @ 60 Hz.
Multi-display	Supports synchronous or asynchronous HDMI + DisplayPort dual-display output.

6. Serial Port Configuration

Port / Source	Default / Optional Function
COM1	DB9 RS232 by default; optional RS485 requires hardware modification and advance production arrangement.
COM2	DB9 RS232 by default; optional console port shares the same COM2 signal.
JCOM2	Optional 2 x 5-pin header sharing the same signals as COM2.
Ordering Note	Standard motherboard supports 2 x RS232 by default; Ordering Information shows 2 COM / 0 RS485.

7. Power, Cooling and Reliability Functions

Item	Description
Main Power	12 V DC input.
AT / ATX Mode	AT-ATX1 jumper selects automatic power-on behavior.
Auto Power-on	1 x optional auto power-on DIP switch is listed in the front-I/O specification.
Cooling	Rear-mounted CPU with fanless cooling design; 1 x reserved 4-pin CPU fan header.
Watchdog	Hardware reset watchdog, 256 levels (0-255 seconds).
Clear CMOS	JBAT1 1 x 3-pin Clear CMOS jumper.

8. Mechanical and Environmental Information

Item	Description
Product Type	120 x 120 mm quad-LAN industrial NUC motherboard.
Dimensions	120 mm x 120 mm.
Operating Temperature	-10°C to 60°C.
Storage Temperature	-20°C to 70°C.
Operating Humidity	5%-95% RH, non-condensing.
Power Input	12 V DC.

9. Ordering Information

Model	Description
NUC32R VER1.1A - N95	N95; 4 cores; up to 3.4 GHz; 15 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 RS485; 12 V.
NUC32R VER1.1A - N100	N100; 4 cores; up to 3.4 GHz; 6 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 RS485; 12 V.
NUC32R VER1.1A - N200	N200; 4 cores; up to 3.7 GHz; 6 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 RS485; 12 V.
NUC32R VER1.1A - i3-N305	Core™ i3-N305; 8 cores; up to 3.8 GHz; 15 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 RS485; 12 V.
NUC32R VER1.1A - N150	N150; 4 cores; up to 3.6 GHz; 6 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 RS485; 12 V.
NUC32R VER1.1A - N250	N250; 4 cores; up to 3.8 GHz; 6 W; DDR4; HDMI + DP; 4 LAN; 5 USB; 2 COM / 0 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-slot count is inconsistent in the source manual: Product Description and Motherboard Specifications state 1 x DDR4 SO-DIMM slot, while the Memory Installation section states 2 x 260-pin DDR4 SO-DIMM slots. This datasheet does not reconcile the discrepancy; confirm the production board before ordering.
- USB counts are presented differently by section. Ordering Information lists 5 USB, while Product Description lists 2 x USB 3.1, 6 x USB 2.0, and 1 x optional USB Type-C (USB 2.0). The detailed I/O section shows shared USB resources between F_USB1, the 4G module, and the Type-C connector. Confirm the required USB population before ordering.

11. Contact Information

Company	CoreIPC
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Disclaimer: This datasheet was compiled from NUC32R User Manual Issue 1.1A. Product specifications, interface counts, supported functions and optional configurations may vary by production revision. Please confirm the selected configuration before order placement. All product names, trademarks and registered trademarks are the property of their respective owners.