

CoreIPC

NUC16R-D4

120 x 120 mm Six-LAN Industrial NUC Motherboard Datasheet

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

Document	Datasheet
Model	NUC16R-D4
Issue	1.1
Product Type	120 x 120 mm Six-LAN Industrial NUC Motherboard
Website	www.CoreIPC.com

This datasheet is prepared based on NUC16R-D4 User Manual Issue 1.1.

1. Product Overview

The NUC16R-D4 is a compact 120 x 120 mm CoreIPC NANO-series six-LAN motherboard supporting Intel® Alder Lake-N and Twin Lake-N processors. It integrates six 2.5GbE ports, DDR4 memory, HDMI + DisplayPort, SATA and M.2 storage, Mini PCIe expansion, USB, serial interfaces, optional GPIO/TPM functions, and 12 V DC input for software routers, network security, industrial control, cloud terminals, and other embedded network applications.

2. Key Features

- Supports Intel® Alder Lake-N and Twin Lake-N processors, with N95, N100, N200, Core™ i3-N305, N150 and N250 variants listed in the source manual.
- 1 x DDR4 SO-DIMM slot supporting single-channel DDR4-3200 memory. Detailed specifications list up to 16 GB.
- 1 x HDMI + 1 x DisplayPort, both supporting up to 4K @ 60 Hz; synchronous/asynchronous dual-display support.
- 6 x Intel® I225-V / I226 2.5GbE ports with Wake-on-LAN and PXE support.
- 1 x SATA 3.0 connector plus 1 x M.2 Key M 2280/2242 slot with PCIe/SATA auto-detection.
- 1 x Mini PCIe slot supporting Wi-Fi/4G by default; mSATA support is available through hardware modification.
- Up to 2 x USB 3.0 and 5 x USB 2.0; additional USB availability depends on 4G usage and header allocation.
- 2 x RS232 serial ports by default. Optional RS485/RS422 configurations require hardware modification and advance production arrangement.
- Fanless thermal design with a reserved 4-pin CPU fan header; optional 5-channel GPIO shares JCOM2 signals and requires customization.
- 120 x 120 mm form factor; 12 V DC input; reserved TPM 2.0 footprint; operating temperature -10°C to 60°C.

3. Technical Specifications

Category	Specification
Processor	Integrated Intel® Celeron® N100 0.8 GHz quad-core processor, TDP 6 W; compatible with the full range of Intel® Alder Lake-N and Twin Lake-N processors.
Memory	1 x SO-DIMM; single-channel DDR4-3200. Detailed specification: up to 16 GB.
Graphics / Display	Integrated Intel® UHD Graphics; 1 x HDMI + 1 x DisplayPort, both supporting up to 4K @ 60 Hz; synchronous/asynchronous dual-display support.
Ethernet	6 x Intel® I225 / I226 2.5GbE controllers with Wake-on-LAN and PXE support.
Storage	1 x SATA 3.0 connector, up to 6 Gbps, mutually exclusive with mSATA signal; 1 x M.2 Key M 2280/2242 PCIe/SATA auto-detect SSD slot.
Expansion	1 x Mini PCIe slot supporting 4G and Wi-Fi by default; mSATA support available through hardware modification.
USB	2 x USB 3.0 plus up to 5 x USB 2.0. One onboard USB group is shared with the 4G function.
Serial Ports	2 x RS232 ports by default. COM1 can be changed from console to a pin header and optionally configured as RS485. JCOM2 can optionally support RS485/RS422.
GPIO	Optional 5-channel GPIO via shared JCOM2 signals; requires custom hardware modification.
TPM	Onboard TPM 2.0 footprint reserved.
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
Network	6 x RJ45 2.5GbE ports.
Display	1 x stacked DisplayPort + HDMI connector; both support 4K @ 60 Hz.
USB	2 x USB 3.0 and 2 x USB 2.0 external ports.
Serial / SIM	1 x console port; 1 x SIM card slot.
Power / Controls	1 x 12 V DC input; HDD LED; Clear CMOS button; auto power-on DIP switch; power button with LED.

4.2 Internal I/O and Headers

Interface / Header	Description
USB 2.0	2 x 2 x 5-pin USB 2.0 headers; three USB 2.0 ports are available for expansion by default, with up to four when 4G is not used.
Serial	2 x optional 2 x 5-pin serial headers. JCOM1 shares COM1 signals; JCOM2 is RS232 by default.
RS485 / RS422	JCOM1 can support RS485 via hardware modification; JCOM2 can be modified for RS485/RS422.
Drive Power	1 x red 1 x 4-pin SATA drive power connector.
Front Panel	1 x 2 x 5-pin front-panel switch and LED header.
Fan	1 x optional / reserved 4-pin CPU fan header.
GPIO	Optional 5-channel GPIO via JCOM2 shared signals; custom hardware modification required.
TPM	Onboard TPM 2.0 footprint reserved.
Clear CMOS / AT-ATX	JBAT1 Clear CMOS jumper and AT-ATX1 power-mode jumper.

5. Display Support

NUC16R-D4 provides a stacked HDMI + DisplayPort connector. The source manual specifies both outputs at up to 4K @ 60 Hz and supports synchronous or asynchronous dual-display operation through HDMI and DP.

Item	Description
Integrated Graphics	Intel® UHD Graphics.
HDMI	1 x HDMI output, up to 4K @ 60 Hz.
DisplayPort	1 x DisplayPort output, up to 4K @ 60 Hz.
Multi-display	Supports synchronous or asynchronous dual-display output through HDMI and DisplayPort.
Connector	Stacked DP + HDMI connector on the external I/O side.

6. Serial Port Configuration

Port / Header	Default / Optional Function
COM1	Console / RS232 by default; can be changed to an onboard JCOM1 header; optional RS485 requires hardware modification.
JCOM1	Optional 2 x 5-pin header sharing COM1 signals.
JCOM2	RS232 by default; optional RS485 or RS422 through hardware modification.
Standard Configuration	Two RS232 ports only; Ordering Information lists 2 COM / 0 RS485.
Optional Differential Serial	RS485/RS422 requires advance production arrangement; contact CoreIPC before ordering.

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.
Cooling	Fanless thermal design; 1 x reserved 4-pin CPU fan header.
Watchdog	Hardware reset watchdog, 256 levels (0-255 seconds).
Clear CMOS	Clear CMOS push button plus JBAT1 1 x 3-pin Clear CMOS jumper.

8. Mechanical and Environmental Information

Item	Description
Product Type	Six-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
NUC16R-D4 N95 VER1.1	Intel® N95; 4 cores; up to 3.4 GHz; 15 W; DDR4; HDMI + DP; 6 LAN; 7 USB; 2 COM / 0 RS485; 12 V.
NUC16R-D4 N100 VER1.1	Intel® N100; 4 cores; up to 3.4 GHz; 6 W; DDR4; HDMI + DP; 6 LAN; 7 USB; 2 COM / 0 RS485; 12 V.
NUC16R-D4 N200 VER1.1	Intel® N200; 4 cores; up to 3.7 GHz; 6 W; DDR4; HDMI + DP; 6 LAN; 7 USB; 2 COM / 0 RS485; 12 V.
NUC16R-D4 i3-N305 VER1.1	Intel® Core™ i3-N305; 8 cores; up to 3.8 GHz; 15 W; DDR4; HDMI + DP; 6 LAN; 7 USB; 2 COM / 0 RS485; 12 V.
NUC16R-D4 N150 VER1.1	Intel® N150; 4 cores; up to 3.6 GHz; 6 W; DDR4; HDMI + DP; 6 LAN; 7 USB; 2 COM / 0 RS485; 12 V.
NUC16R-D4 N250 VER1.1	Intel® N250; 4 cores; up to 3.8 GHz; 6 W; DDR4; HDMI + DP; 6 LAN; 7 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 capacity is inconsistent in the source manual: the Product Description states DDR4-3200 up to 32 GB, while the detailed Motherboard Specifications state up to 16 GB. This datasheet uses 16 GB in the main specification table and recommends confirming the validated maximum capacity before order placement.
- The Product Description calls the board 'NUC16-D4' once, while the document title, ordering information, and board image use 'NUC16R-D4'. Serial, GPIO, mSATA and TPM functions also depend on optional hardware configuration; confirm the selected production BOM before ordering.

11. Contact Information

Company	CoreIPC
Sales Team	CoreIPC Sales Team
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Disclaimer: This datasheet was compiled from NUC16R-D4 User Manual Issue 1.1. Product specifications, interface counts 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.