

CoreIPC

RUT40R

Mini-ITX Router Motherboard Datasheet

Intel® Gemini Lake Refresh Platform

Document	Datasheet
Model	RUT40R
Issue	1.2
Product Type	Mini-ITX Router Motherboard
Website	www.CoreIPC.com

This datasheet is prepared based on RUT40R User Manual Issue 1.2.

1. Product Overview

The RUT40R is a CoreIPC Mini-ITX software router motherboard based on the Intel® Gemini Lake Refresh platform. It integrates an Intel® Celeron® J4125 quad-core processor and provides four 2.5GbE LAN ports, flexible wireless expansion, mSATA/SATA storage options, serial interfaces, and 12 V DC input. It is designed for software routing, network security, cloud terminals, communication control, and related embedded networking applications.

2. Key Features

- Integrated Intel® Celeron® J4125 quad-core 2.0 GHz processor, 10 W TDP; compatible with Intel® Gemini Lake Refresh processors.
- 1 x DDR4 SO-DIMM slot supporting single-channel DDR4-2400 memory, up to 16 GB.
- 4 x Intel® I225 or I226 2.5GbE Ethernet ports; optional 2 x bypass groups; Wake-on-LAN and PXE support.
- Display support through VGA and optional HDMI.
- Storage options include full-size mSATA 3.0, SATA 3.0, and optional 2.5-inch SATA 3.0 drive connection; mutually exclusive configurations apply as specified in the source manual.
- 1 x Mini PCIe slot for Wi-Fi/4G and 1 x M.2 Key B slot for 5G modules.
- 2 x USB 3.0 ports plus up to 4 x USB 2.0 ports through front/onboard configurations.
- 1 x Cisco-compatible RS232 console port; optional COM header and optional RS485 headers are available according to configuration.
- Fanless thermal design with reserved CPU and system fan headers; supports 4-channel GPIO and hardware watchdog.
- Mini-ITX 170 x 170 mm; 12 V DC input (±5%); operating temperature -20°C to 60°C.

3. Technical Specifications

Category	Specification
Processor	Integrated Intel® Celeron® J4125 quad-core processor, 2.0 GHz, TDP 10 W; compatible with Intel® Gemini Lake Refresh processors.
Memory	1 x SO-DIMM slot; single-channel DDR4-2400, 1.2 V; up to 16 GB.
Graphics / Display	Integrated Intel® UHD Graphics 600; 1 x VGA; 1 x HDMI optional.
Ethernet	4 x Intel® I225 or I226 2.5GbE ports; optional 2 x bypass groups; Wake-on-LAN and PXE support.
Storage	1 x full-size mSATA 3.0 slot; 1 x SATA 3.0 connector; optional 2.5-inch SATA 3.0 drive connector. Mutual-exclusion rules apply as specified in the source manual.
Expansion	1 x Mini PCIe slot for half/full-size Wi-Fi or 4G modules; 1 x M.2 Key B slot for 30 x 52 mm 5G modules.
USB	2 x USB 3.0 rear ports; USB 2.0 available through front and onboard ports/headers, up to 4 ports according to configuration.
Serial	1 x Cisco-compatible RS232 console port; 1 x optional COM header; optional RS485 headers for COM3/COM4.
GPIO	4 GPIO input/output channels.
BIOS	64 Mb Flash ROM.
Watchdog	Hardware watchdog timer, 256 levels, 0-255 seconds.
OS Support	Windows 10 / Linux / ROS / iKuai.
Power	12 V DC input (±5%); AT/ATX mode selectable.
Cooling	Fanless thermal design; 1 x 4-pin CPU fan header and 1 x 4-pin system fan header reserved.
Operating Temperature	-20°C to 60°C.
Storage Temperature	-20°C to 70°C.
Operating Humidity	5%-95% RH, non-condensing.
Dimensions	170 mm x 170 mm.

4. I/O Interface Summary

4.1 Rear Panel I/O

Interface	Description
LAN	4 x 2.5GbE RJ45 ports.
USB	2 x standard USB 3.0 ports.
Serial Console	1 x Cisco-compatible RS232 console port.
Controls / Indicators	1 x power button; optional Clear CMOS button; 1 x HDD/Power LED indicator.
Power	1 x 12 V DC input connector.

4.2 Internal I/O and Headers

Interface / Header	Description
VGA	1 x JVGA 1 x 12-pin header.
USB 2.0	1 x vertical standard USB 2.0 port optional; 2 x USB 2.0 via 2 x 5-pin header; additional front USB 2.0 options are configuration-dependent.
COM	1 x optional 2 x 5-pin COM header.
RS485	Optional RS485 header(s) for COM3/COM4 as specified in the source manual.
LAN LED	1 x 2 x 8-pin LAN LED header.
HDD Power	1 x 1 x 4-pin HDD power connector.
ATX Power	1 x 4-pin ATX connector configurable as 12 V input or output.
Front Panel	1 x 2 x 5-pin front-panel header for switches and LEDs.
Fan Headers	1 x 4-pin CPU fan header and 1 x 4-pin system fan header.
GPIO	1 x 2 x 5-pin GPIO header supporting 4 inputs / 4 outputs.

5. Display Support

RUT40R provides 1 x VGA output and an optional HDMI output. The source manual identifies VGA as standard and HDMI as optional; no display resolution limits are specified in the detailed specification.

Item	Description
Integrated Graphics	Intel® UHD Graphics 600.
VGA	1 x VGA output; standard interface.
HDMI	1 x HDMI output; optional.
Resolution	Maximum display resolutions are not specified in the source manual.
Configuration Note	HDMI availability depends on the selected production configuration.

6. Serial Port Configuration

Port / Source	Default / Optional Function
Rear Console	1 x Cisco-compatible RS232 console port.
COM2 Header	1 x optional standard 2 x 5-pin COM header.
RS485	Optional 2 x 3-pin RS485 header; source manual associates RS485 with COM3/COM4.
Product Description	Lists 2 x RS232 and 2 x optional RS485 serial ports.
Configuration Note	Serial-port counts differ between sections of the source manual; confirm the required production configuration before ordering.

7. Power, Cooling and Reliability Functions

Item	Description
Main Power	12 V DC input (±5%).
AT / ATX Mode	AT-ATX1 jumper selects automatic power-on behavior after power restoration.

Item	Description
Fanless Design	Designed for fanless operation.
Reserved Fan Headers	1 x 4-pin CPU fan header and 1 x 4-pin system fan header.
Watchdog	Hardware watchdog timer, 256 levels, 0-255 seconds.
Clear CMOS	JBAT1 1 x 3-pin Clear CMOS header; optional rear Clear CMOS button.

8. Mechanical and Environmental Information

Item	Description
Product Type	Mini-ITX software router motherboard.
Dimensions	170 mm x 170 mm.
Operating Temperature	-20°C to 60°C.
Storage Temperature	-20°C to 70°C.
Operating Humidity	5%-95% RH, non-condensing.
Thermal Design	Fanless thermal design; suitable for sealed system integration.

9. Ordering Information

Model	Description
RUT40R VER1.1	Intel® Celeron® J4125; 4 cores; 2.0 GHz; DDR4; 4 LAN; 5 USB listed in Ordering Information; 3 expansion interfaces; 1 COM / 0 RS485 listed; 12 V DC.
LAN Option	4 x Intel® I225 or I226 2.5GbE; optional 2 x bypass groups.
Wireless Options	Mini PCIe for Wi-Fi/4G; M.2 Key B for 5G.
Storage Options	mSATA configured by default; SATA / 2.5-inch SATA options are subject to mutual-exclusion rules.
Revision Note	Ordering Information shows VER1.1; I/O layout drawing shows VER1.2. Confirm production revision before ordering.

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.
- The source manual is Issue 1.2, while the Ordering Information row identifies RUT40R VER1.1; the mechanical I/O drawing is labeled VER1.2. Confirm the production revision before order placement.
- Serial-port descriptions vary by section: the product overview lists 2 x RS232 and 2 x optional RS485, while the detailed specification identifies 1 x Cisco-compatible RS232 console port plus optional COM and RS485 headers. Confirm the required serial configuration before ordering.

11. Contact Information

Company	CoreIPC
Sales Team	CoreIPC Sales Team
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Disclaimer: This datasheet was compiled from RUT40R User Manual Issue 1.2. 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.