EQIO

RISC-RV64

PRODUCT MANUAL

RISC-V AI Edge Embedded Industrial PC

64-bit RISC-V RV64GC 4-core processor



Application illustration (not a product photo); shipped units may differ.

Measurement and control, made easy.

Easy · Quick · Input · Output

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01 OVERVIEW

RISC-V AI Edge Embedded Industrial PC

Embedded industrial PC · Industrial vision · Industrial detection · Edge AI

RISC-RV64 uses 64-bitRISC-V 4-core compute platform, configured with 6GB LPDDR4 and 64GB eMMC, integrates deep learning processing engine, provides 3-ch Gigabit Ethernet, USB, HDMI and PCIe expansion capability.
Multi Ethernet port can respectively connect data from source and control network, display and peripheral I/O facilitates configured with local operation and expansion equipment. Suited to industrial field data aggregation, equipment gateway and edge processing node, compute and communications centralized the same host in.



Application illustration (not a product photo); shipped units may differ.

Key features

- 64-bitRISC-V 4-core platform
- 6GB LPDDR4 and 64GB eMMC
- 3-ch Gigabit Ethernet
- Dual USB3.0 and dual USB2.0
- HDMI and PCIe3.0 connect

02 FUNCTIONS

Functions and engineering value

RISC-V edge computing platform

Uses 64-bitRV64GC 4-core processor, configured with 6GB LPDDR4 and 64GB eMMC, supports SylixOS and Linux. DNN rated 19.95 TOPS INT8, can evaluate adapts edge model, actual performance depends on to model, operator and toolchain.

Multi Ethernet port and external expansion

3-ch Gigabit Ethernet, 2-ch USB3.0 and 2-ch USB2.0 can used for connect data equipment and field peripherals, PCIe3.0 supports external acceleration card. PCIe channel width, connect form, power and driver conditions not stated, expansion solution requires specific board determine rear verification.

Display and video processing resources

Data lists HDMI display interfaces, HAE engine, three-layer OSD overlay and H.265/H.264 hardware acceleration capability, can as graphics application technical based on. External HDMI quantity 1, display combination and video processing upper limit required based on system implements confirm, not can be chip capability increase external port.

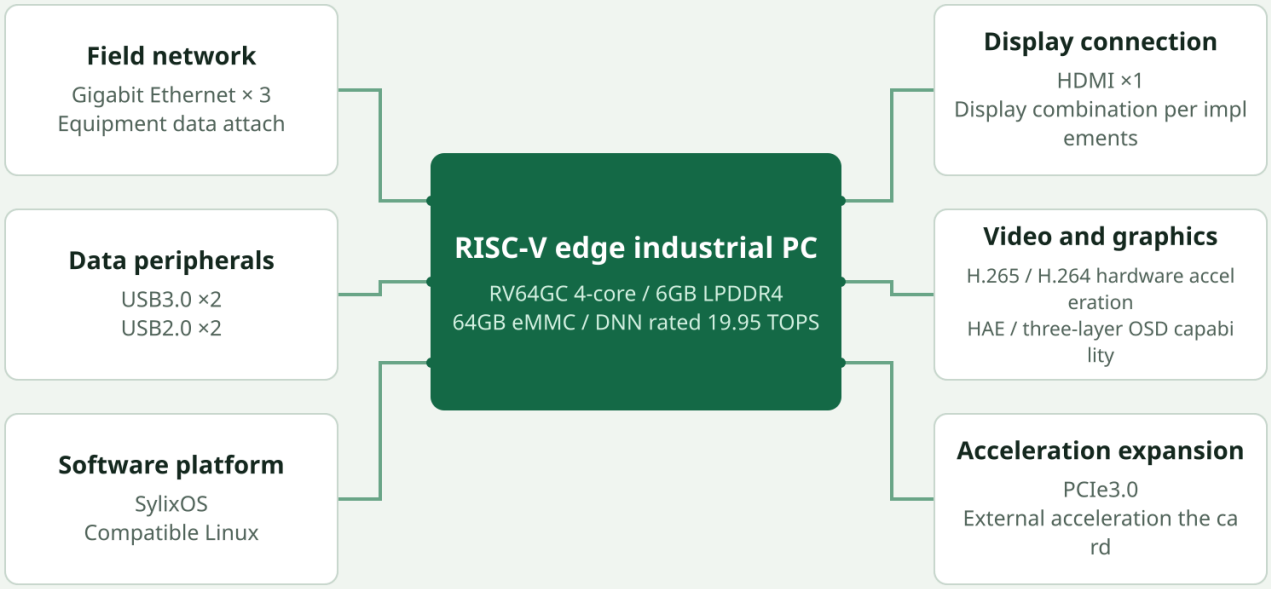
The functional notes explain the product’s role from published configuration. Optional functions, software and peripherals follow the project definition. Chip capability is not the same as implemented I/O.

03 ARCHITECTURE

Product functional architecture

FUNCTIONAL BLOCK DIAGRAM

RISC-RV64



Functional relationships · lines do not show internal circuits, pins or dedicated bus topology

From published specification illustrative functional grouping, does not show internal circuits, on-board bus or signal routing; I/O direction actual protocol shall prevail. Graphics and DNN platform capability note, not indicates added video input or display port; PCIe expansion parameters required confirm.

Platform and I/O

Uses 64-bitRISC-V RV64GC 4-core processor, configured with 6GB LPDDR4 and 64GB eMMC, DNN rated 19.95 TOPS INT8, data gives run DNN when typical power consumption 8W. RV64GC is ISA describe rather than specific chip model, continuous performance, peak power consumption and toolchain still requires per actual platform confirm.

> **Reading the diagram**
>
> Solid lines show published functional relationships, not on-board buses, bridge chips or connector pins. Optional controllers, radios, storage and software follow the configuration and interface files.

04 SPECIFICATIONS

Technical specifications

Compiled from published product data. Batch, I/O and environmental ratings follow the order confirmation.

Core system

Processor	64-bit RISC-V RV64GC 4-core processor; DNN acceleration rated 19.95 TOPS (INT8)
Capacity	LP DDR4 6G, storage configured with: EMMC5.1 64GB (supports expansion)
Graphics processing	HAE engine, 3D GPU supports OSD diagram layer overlay (3 layer), hardware acceleration HEVC (H.265) /AVC (H.264)
Operating system	Real-time operating system (SylixOS), compatible Linux etc.main stream system

I/O and expansion

USB	USB 3.0×2，USB 2.0×2
Network interfaces	Gigabit Ethernet × 3 (RGMII protocol)
Expansion	PCIe3.0 (supports external acceleration card)
Display	HDMI × 1 (supports multi-display output)

Mechanical specifications and system requirements

Environmental ratings	Operating temperature: -20°C ~ 60°C, storage temperature: -40°C ~ 85°C
Typical power consumption	8W (run DNN when)

05 COMPONENTS

Processor and device specifications

Device figures come from vendor publications and describe the chip or module. The implemented product follows the specification tables. Optional devices are supplied with the selected configuration.

RISC-V International (ISA specification organize; product SoC vendor not known) RV64GC

Basic integer architecture	RV64I, 64-bit basic integer ISA
G meaning	I, M, A, F, D, Zicsr, Zifencei general-purpose combination
M expansion	Integer×method and division
A expansion	Atomic operation
F/D expansion	Single accuracy/dual accuracy floating-point
C expansion	Compression command expansion, can used 16-bit en code

Sources: RISC-V International, RISC-V Ratified Specifications: RV32/64G Instruction Set Listings.

06 APPLICATIONS

From product capability to applications

Industrial vision edge processing

Can via Gigabit Ethernet or USB connect compatible vision data source, RISC-V platform deployment already adapts graphics processing or DNN application. Model accuracy, operator supports, camera driver and end to end latency should each item test, rated TOPS not can directly replace compute into detection frame rate.

Industrial detection data node

3-ch Gigabit Ethernet facilitates organize device connection, 6GB memory and 64GB eMMC local application provides resources, HDMI used for view detection status. Actual detection capability from external sensing equipment and software algorithm definition, storage retain, fault alarm and result on transmit must be application implements.

Can expansion edge gateway

Platform can run SylixOS or compatible Linux software environment, uses network and USB aggregation equipment data, and per project evaluate PCIe acceleration card. Requires increase hardware must check I/O form, power and driver; data in DNN run typical 8W not cannot be treated as add-in card rear product upper limit.

Integration checks

CPU and toolchain	Confirm specific chip model, RISC-V en environment, SylixOS/Linux image and application compatible.
AI measured	INT8 target model verification operator, accuracy and latency, 19.95 TOPS rated value.
PCIe expansion	Confirm PCIe3. 0-channel width, connector, power and external acceleration card driver.
Power consumption and display	DNN typical 8W not etc. To maximum power consumption; single HDMI multi-display method required specific confirm.

07 CONFIGURATION

Configuration, options and selection

Configuration

Provides SylixOS and Linux system supports, PCIe I/O can connect external acceleration card.

Selection guide

Order confirmation	Batch, I/O and environmental ratings follow the order confirmation
Published data	Compiled from published product data; EQIO provides selection and system integration
Configuration talk	Share the application, I/O count, environment and software so a configuration can be proposed

Request a quotation and selection support

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EQIO

Easy · Quick · Input · Output

BRAND

Measurement and control, made easy.



EQIO product family · concept rendering

Brand story

EQIO builds measurement and control products and systems. The name stands for Easy Quick Input Output: Easy is a clear structure that is quick to learn, Quick is a direct path to efficient delivery, and Input / Output is every link between the device under test and the control system.
The soft single-cycle wave inside the Q links the brand to signals, acquisition and I/O. “Measurement and control, made easy” is our promise for every selection, integration and delivery.

What we do

Products

Data acquisition, test instruments, control and I/O, modular platforms, software, cables

Systems

Configured to the measurand, channels, accuracy and software, from design to commissioning

Support

Selection advice, training, maintenance and calibration

How we deliver

01
Requirements

02
Solution design

03
Build & integration

04
Factory test

05
Delivery & training

06
Ongoing support

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