EQIO

WJ-E1A

PRODUCT MANUAL

RK3588M AI Edge Computing Box

Rockchip RK3588M 8-core processor



Measurement and control, made easy.

EQIO.COM

Easy · Quick · Input · Output

01 OVERVIEW

RK3588M AI Edge Computing Box

AI edge computing box · Unit unit vision · Edge computing · Industrial automation · Rockchip

WJ-E1A uses RK3588M 8-core compute platform, configured with 8 GB memory and 128GB eMMC, integrates graphics and neural network processing resources. Provides 3-ch Gigabit Ethernet and multi type industrial I/O, uses aluminium-alloy housing and 12V DC power.
RS-422/485, USB, Type-C and 8-ch GPIO convenient attach sensing unit and control peripherals, independent debug and programming I/O facilitates maintenance. Suited to industrial gateway, equipment data aggregation and space limited field compute node.



Product appearance reference; shipped units may differ.

Key features

- RK3588M 8-core compute platform
- 8GB memory and 128GB eMMC
- 3-ch Gigabit Ethernet
- RS-422/485 and 8-ch GPIO
- 12V power, aluminium-alloy housing

02 FUNCTIONS

Functions and engineering value

Edge computing and inference resources

RK3588M 8-core processor together with Mali-G610 MC4 graphics resources and rated 6 TOPS NPU, configured with 8 GB LPDDR4 and 128GB eMMC. Can edge application provides compute and local storage, model operator supports, accuracy and actual throughput required via target software verification.

Multi network domain and industrial equipment attach

3 Gigabit LAN I/O can used for attach different network devices, RS-422/485, USB and 8-ch GPIO industrial peripherals provides connect method. Multiplexed IO uses 3.3V signal level, connect sensing or actuation equipment when confirm signal definition, avoid directly attach not match voltage.

Compact deployment and maintenance expansion

165 × 100 × 45mm aluminium-alloy enclosure uses 12V DC input, power and run indicator facilitates field observe. Independent UART debug and programming I/O supports maintenance operation, can per solution expansion 4G/5G and SSD module, expansion space and power consumption required combined with installed module check.

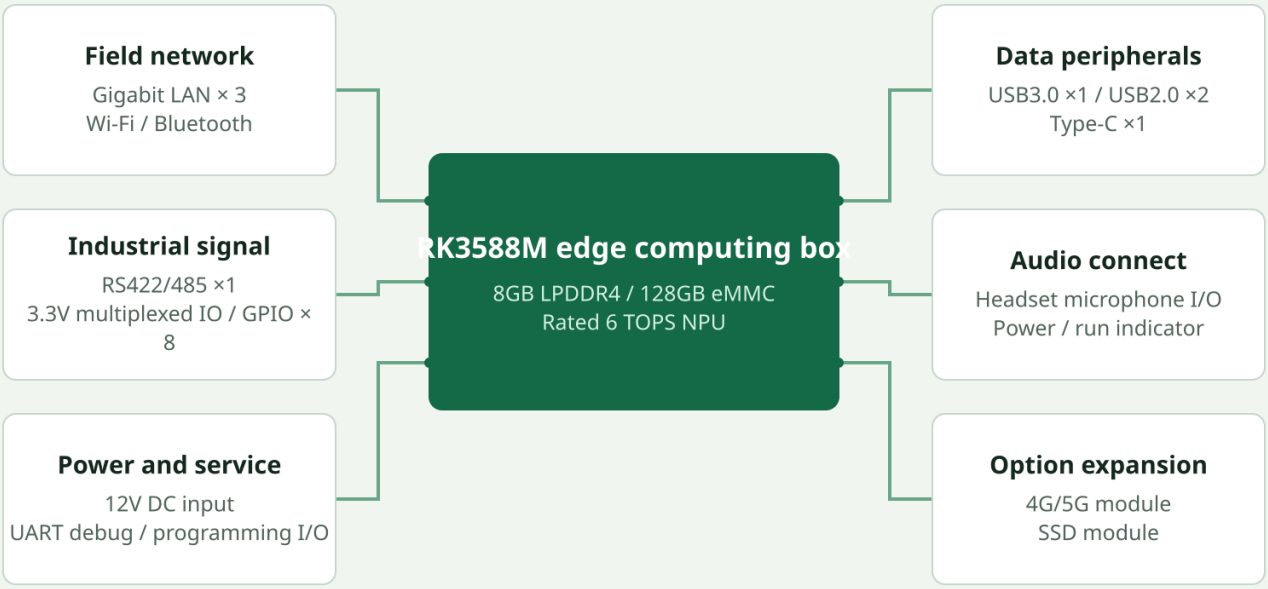
The functional notes explain the product’s role from published configuration. Optional functions, software and peripherals follow the project definition. Chip capability is not the same as implemented I/O.

03 ARCHITECTURE

Product functional architecture

FUNCTIONAL BLOCK DIAGRAM

WJ-E1A



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.

Platform and I/O

Uses RK3588M, 4 × Cortex-A76 and 4 × Cortex-A55 consists of 8-core CPU, configured with Mali-G610 MC4, 8GB LPDDR4 and 128GB eMMC. Data rated NPU6 TOPS and lists hybrid accuracy supports; measured inference performance and driver capability must still used target application verification.

> **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

CPU	Rockchip RK3588M, 4 × Arm Cortex-A76 + 4 × Arm Cortex-A55, 8-core
GPU	ARM Mali-G610 MC4
NPU performance	6 TOPS, supports int4/int8/int16/FP16/BF16/TF32 hybrid compute
Capacity	8GB LPDDR4+128GB eMMC 5.1

Environmental conditions

Operating temperature	Operating temperature: -40°C ~ 60°C, storage temperature: -40°C ~ 70°C
Can reliability	ESD: air ±8KV, contact ±6KV, resist vibration: omnidirectional 8g

Mechanical specifications and system requirements

Dimensions / weight	165 × 100 × 45 mm (long × wide × high, ±1mm), weight≤1.5Kg
Power	12V DC power, power / run status indicator

I/O and expansion

Network communications I/O	Gigabit Ethernet port × 3, LAN1/LAN2/LAN3, supports multi network domain attach, supports WiFi Bluetooth communications
Data I/O	USB 3.0 ×1、USB 2.0 ×2、Type-C ×1
Serial	RS422/485 ×1
Input output	Multiplexed IO port × 1, 3.3V signal level, function can configured with; GPIO × 8, GPIO
Debug and maintenance	UART debug serial × 1, programming I/O × 1
Audio	Headset microphone × 1, can expansion 4G/5G, SSD etc.module

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.

Rockchip RK3588M

Process	8 nm
CPU structure	4 × Cortex-A76 + 4 × Cortex-A55, 8-core
NPU rated	6 TOPS
SoC display engine capability	8K display/video, native seven display display capability
SoC native Type-C controller	2-ch
SoC imaging processing resources	Dual 16M ISP, at least 12-ch camera supports

Sources: Rockchip, Rockchip release RK3588M intelligent vehicle-mounted surround view solution.

06 APPLICATIONS

From product capability to applications

Industrial vision edge node

Can via Gigabit Ethernet or USB attach uses compatible protocol graphics equipment, local deployment graphics processing and already adapts inference model. NPU rated capability platform evaluate provides reference, actual camera channel count, frame rate and model latency must follow input specification and application load test.

Equipment data aggregation gateway

3 LAN port suited to connect equipment side and application side network, RS-422/485 used for compatible field instrument, GPIO can attach low signal level status signal. Data acquisition, protocol conversion and on reported by application implements, network isolation policy and serial operation mode should system design in stated.

Space limited control node

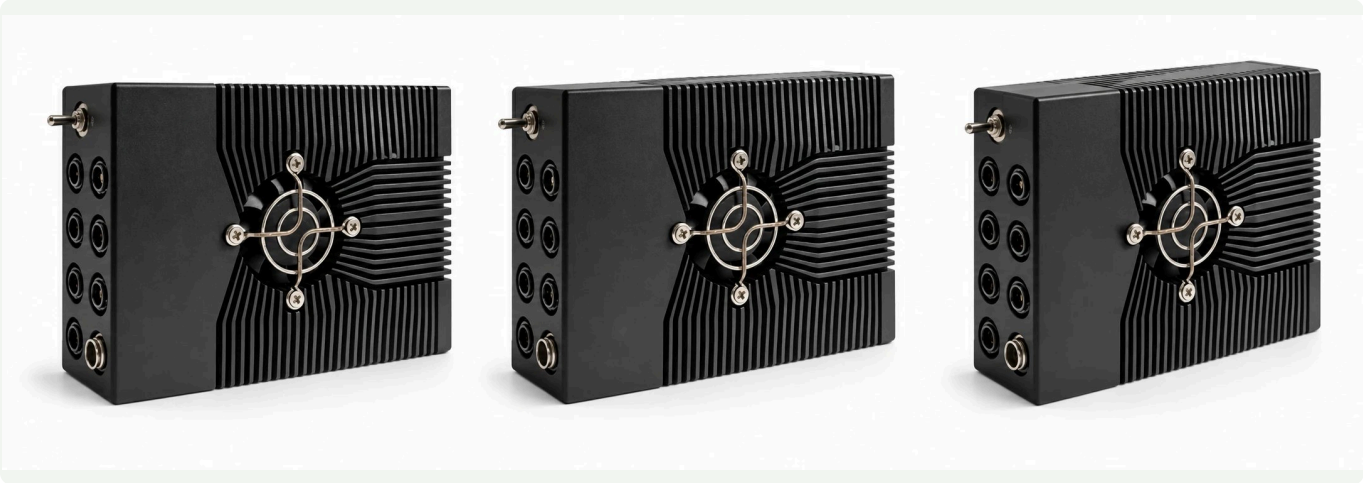
Compact aluminium alloy housing can placement to equipment internal or field control space, 12V input and run indicator convenient integrates. Peripherals via USB, serial or GPIO connect, maintenance when used dedicated debug interface; if increase communications or SSD module, should again check cooling and power margin.

Integration checks

AI application verification	Target model, accuracy, input dimensions and latency verification NPU application, not 6 TOPS inferred throughput.
IO electrical	Multiplexed IO and GPIO involve and 3.3V signal, confirm signal level, direction and necessary external conversion.
Communications topology	Planning LAN1/LAN2/LAN3 and RS-422/485 mode, address and protocol.
Expansion and power	Confirm 4G/5G, SSD option range and 12V input, cooling installation conditions.

07 CONFIGURATION

Appearance, configuration and selection



Multi-angle reference (generated from product photos); shipped units may differ.

Configuration

Can expansion 4G/5G communications and SSD module, provides power and run status indicator.

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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