EQIO

AXIS-358-RB

PRODUCT MANUAL

RK3588 Motion-Control Board

Rockchip RK3588 8-core processor



Appearance reference (generated from product photos); shipped units may differ.

Measurement and control, made easy.

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Easy · Quick · Input · Output

01 OVERVIEW

RK3588 Motion-Control Board

Robot perception and motion control · Robot motion control · Multi sensing unit integrates · Payload management · EtherCAT · Rockchip

AXIS-358-RB uses RK3588 8-core processor, configured with 16GB memory and eMMC storage, supports Linux and ROS2, provides 4-ch EtherCAT, 2-ch CAN and debug and peripheral I/O. Dual Gigabit Ethernet used for system communications, serial, GPIO, SPI and I2C facilitates attach external control and status signal. Board on RTC uses battery keep, display and debug interface suited to local HMI, can used for robot joint control, equipment actuation and automation test node.



Product appearance reference; shipped units may differ.

Key features

- RK3588 8-core platform and 16GB memory
- 4-ch EtherCAT, 2-ch CAN
- Dual Gigabit Ethernet
- 6-ch GPIO and SPI/I2C
- Linux and ROS2 system supports

02 FUNCTIONS

Functions and engineering value

Motion task and system software

Board uses RK3588 8-core platform, configured with 16GB memory and eMMC storage, provides Linux and ROS2 environment. Can hosts motion task management and equipment status HMI, actual control cycle and real-time special depends on to application, driver and system configured with, not can from processor core count directly inferred.

Motion bus and peripheral communications

4-ch EtherCAT, 2-ch CAN used for motion equipment and peripheral node connect, dual Gigabit Ethernet carries on grade communications and system data. Multiple bus I/O can per task role split organize, but port role, main from function, synchronous method and used software protocol stack requires combined with specific control solution confirm.

Debug and signal expansion

Serial, independent debug interface, Type-C and MicroHDMI facilitates software debug and local operation, 6-ch GPIO and SPI, I2C used for expansion equipment signal. With battery keep RTC provides RTC, board 12V power, peripheral connect should check signal signal level and grounding method.

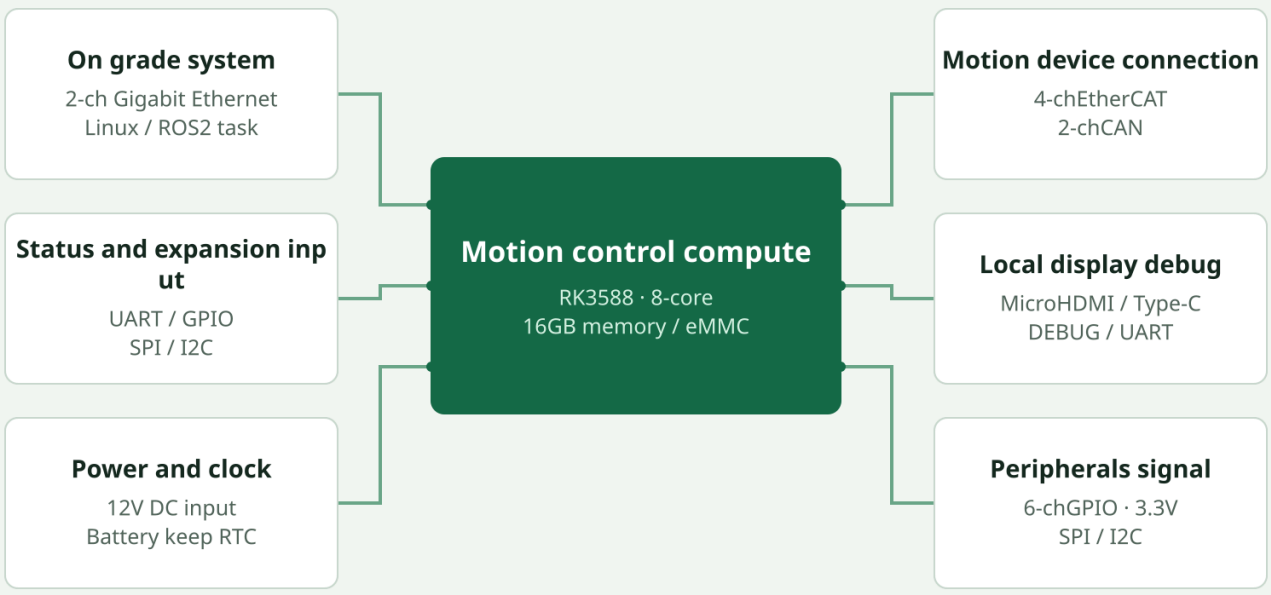
The functional notes explain the product’s role from published configuration. Optional functions, software and peripherals follow the project definition. Chip capability is not the same as implemented I/O.

03 ARCHITECTURE

Functional blocks and system connections

FUNCTIONAL BLOCK DIAGRAM

AXIS-358-RB



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

Function relationship illustration, based on website I/O and configured with compiled; not indicates actual on-board circuit, independent bandwidth or not published chip interconnect implements.

Platform and I/O

Board compute core RK3588 8-core processor, 16GB memory and eMMC forms application run and storage basic, Linux and ROS2 provides software organize environment. Chip up to clock and this board at least 2.0GHz configured with should separate, chip NPU peak also not represent motion control real-time or algorithm throughput.

> **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 RK3588, 8-core, clock≥2.0GHz
Capacity	LPDDR5/4, capacity 16GB + eMMC5.1, capacity＞64GB
Operating system	Linux + ROS2 operating system
Clock	Supports RTC RTC, built-in battery power

Environmental conditions

Operating temperature	Operating temperature: -20°C ~ 50°C, storage temperature: -20°C ~ 60°C
Humidity	Relative humidity (RH) 20%–80%

I/O and expansion

Motion control bus	EtherCAT bus 4-ch, CAN bus 2-ch
Network and debug	Gigabit Ethernet 2-ch, Type-C I/O 1-ch, UART serial (3.3V) 2-ch, DEBUG debug interface 1-ch
AV interfaces	MicroHDMI I/O 1-ch
Expansion bus	SPI I/O (3.3V) 1-ch, I2C I/O (3.3V) 1-ch
GPIO	GPIO I/O (3.3V) 6-ch

Mechanical specifications and system requirements

Power	12V DC input, board installation face positive face equipped with status LED

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 RK3588

Manufacturing process	8 nm
CPU architecture	4 × Arm Cortex-A76 + 4 × Arm Cortex-A55, 64-bit 8-core
Clock reference	Up to 2.4GHz
Graphics processor	Arm Mali-G610 MC4, integrates 2D graphics acceleration
Graphics and compute API	OpenGL ES 3.2；Vulkan 1.1；OpenCL 2.0
NPU rated peak	6 TOPS
NPU structure and accuracy	3-core NPU; supports INT4/INT8/INT16/FP16/BF16/TF32
Memory controller	LPDDR4/LPDDR4X/LPDDR5, 4-channel × 16bit
L3 cache	3 MB
Native storage interfaces	eMMC 5.1、SD3.0/MMC4.5

Rockchip RK3588 (continued)

PCIe3.0-channel combination	1×4 / 2×2 / 4×1
Native Gigabit Ethernet MAC	2-ch
Native low-speed controller	10×UART、6×SPI、9×I2C
Video decode upper limit note	H.265/H.264/AV1/AVS2 etc.format, up to 8K@60fps, per en code format and code stream configured with
Video encode upper limit	H.264/H.265 up to 8K@30fps
Chip display interfaces	EDP, DP, HDMI2.1, MIPI, multi-display display engine
Video input	MIPI CSI-2/DVP; HDMI2.0 RX up to 4K@60fps

Sources: Rockchip, Rockchip RK3588 official product specification; Rockchip, RK3588 Brief Datasheet V1.0 2025-08-28; Rockchip, Rockchip Toybrick TB-RK3588X development board released.

06 APPLICATIONS

From product capability to applications

Robot motion control

Can around EtherCAT and CAN connect motion node, from Linux and ROS2 application organize task, status and system HMI. Control system integration when, should per actuation unit protocol check I/O role, main from configured with and driver, again verification target control cycle, synchronous requirement and fault processing procedure.

Multi sensing unit and actuation coordination

Can via Gigabit Ethernet, UART and general-purpose expansion I/O attach sensing or status equipment, again and motion bus on actuation node switch task information. Sensing data, control status and display operation can the same platform in organize, but different equipment time and communications timing requires from application coordinate.

Payload and equipment management

Suited to payload or automation equipment in centralized run control application, via CAN, serial and GPIO switch status, MicroHDMI and debug interface completes field configured with. Peripheral function from connect equipment and software definition, power, signal signal level and system on electrical sequence should bring-up front stated.

Integration checks

Capacity aperture	16GB memory, website mark LPDDR5/4; eMMC5.1 capacity＞64GB, specific storage specification per configured with confirm.
Bus function	4-chEtherCAT and 2-chCAN; port role, protocol stack, control cycle and synchronous performance required solution verification.
Software and debug	Linux+ROS2; check sensing unit and actuation unit driver, retain DEBUG, UART and local display debug path.
Electrical and environment	12V DC input, GPIO/SPI/I2C3.3V; operation−20–50°C, humidity 20%–80%.

07 CONFIGURATION

Appearance, configuration and selection



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

Configuration

Uses 12V DC input, provides eMMC storage, Micro HDMI and independent debug interface.

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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