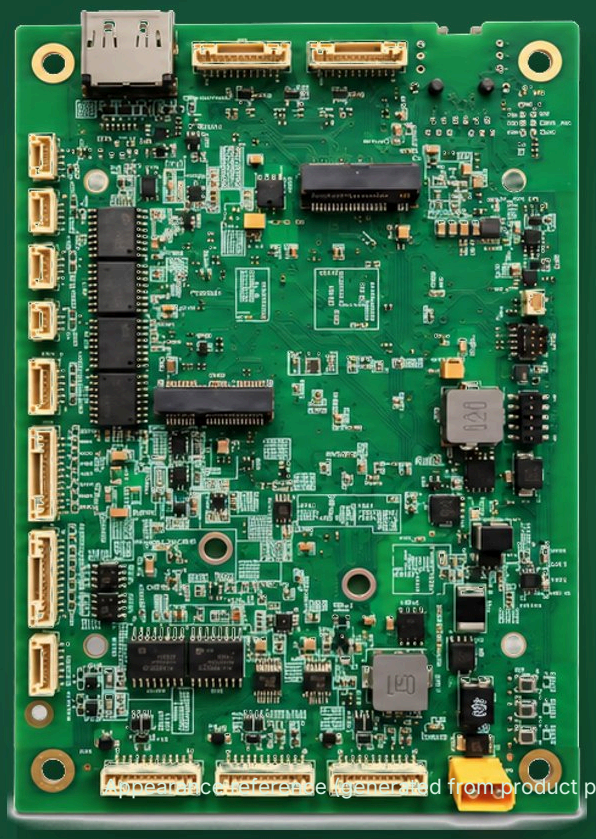
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PRODUCT MANUAL

Jetson AGX Orin Robot Main Compute Kit

NVIDIA Jetson AGX Orin 64GB; 12-core Arm Cortex-A78AE



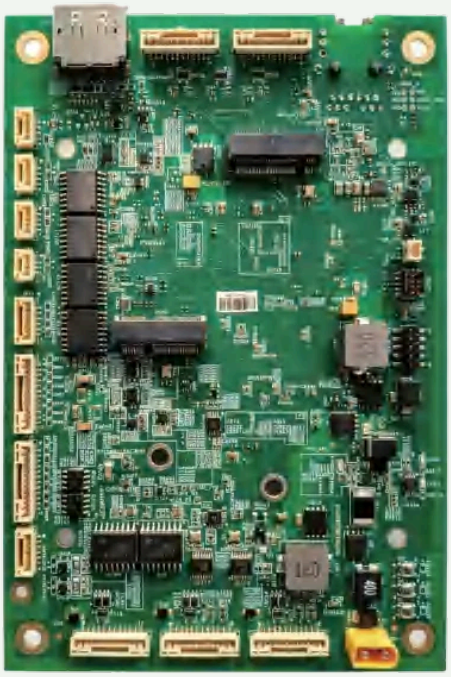
Representative view (generated from product photos); shipped units may differ.

01 OVERVIEW

Jetson AGX Orin Robot Main Compute Kit

Robot perception and motion control · Robot perception · Multi sensing unit fusion · Edge AI · NVIDIA

ERB-MAIN-001 from Jetson AGX Orin 64GB module and carrier consists of, configured with 64GB LPDDR5 and 64GB eMMC. Carrier integrates independent MCU performs power, temperature and status management, and provides multi type isolated and high-speed I/O.
10GbE, USB and isolated RS-485 connect data and control equipment, module and MCU via serial and GPIO HMI. Carrier compute and management resources centralized layout, suited to robot main compute, inspection graphics processing and multi sensing data aggregation node.



Product appearance reference; shipped units may differ.

Key features

- Jetson AGX Orin 64GB module
- 64GB LPDDR5 and 64GB eMMC
- Independent MCU health management
- 10GbE, USB and isolated RS-485
- 155 × 105mm carrier structure

02 FUNCTIONS

Functions and engineering value

Main compute module and carrier

Kit from AGX Orin 64GB module and carrier consists of, combined with processor, graphics and tensor compute resources hosts robot perception and multi source data processing. Module provides 64GB memory and 64GB storage space, specific algorithm behaviour still requires combined with model, power consumption mode and software environment evaluate.

Independent health management unit

Carrier settings independent MCU used for power, temperature and status management, Orin and MCU via UART, GPIO and reset signal HMI. Compute task and management function can respectively organize, run status, alarm threshold and reset procedure should be system software stated, not cannot only based on I/O storage inferred management policy.

High-speed data and isolated control

Already brought out 10GbE, 2-ch USB3.0, 6-ch USB2.0 and isolated RS-485 used for data and control connect, MCU additional provides isolated serial and PWM. M.2, Gigabit network and multi type isolated bus belongs to reserved resources, requires distinguish I/O reserved, actual assembly and software can used status.

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

ERB-MAIN-001



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

Compute core Jetson AGX Orin 64GB module, includes 12-core processor, graphics and tensor compute resources, carrier separately provided independent MCU. Module chip capability, actual brought out I/O and reserved I/O should layered note; website not to MCU specific model, not used common device name instead of.

> **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

Compute core	NVIDIA Jetson AGX Orin 64GB: 12-core Arm Cortex-A78AE, up to 2.2GHz; 2048-coreAmpere GPU, 64 Tensor Core, up to 1.3GHz; up to 275 TOPS (INT8 sparse)
Capacity	Memory 64GB 256bit LPDDR5 (204.8GB/s); storage 64GB eMMC5.1
RTC	ORIN module mount RTC RTC
MCU	Clock≥72MHz, Flash≥128KB, SRAM≥32KB, add-on FLASH≥128Mb
Carrier power input	12V DC±10%, power≥120W

I/O and expansion

ORIN module external port	1-ch isolated RS-485, 1-ch 10GbE network, 2-chUSB3.0, 6-chUSB2.0
MCU external port	2-ch isolated RS-485, 1-ch isolated PWM signal
Debug interface	MCU debug UART/JTAG I/O, ORIN module debug JTAG/UART I/O
ORIN module/MCU interconnect I/O	1-chUART, 2-chGPIO, ORIN reset signal
Reserved I/O	M.2 Key-M, M.2 Key-E, Micro SD I/O, 1*Gigabit network, 2*isolated CAN 2*isolated I2C, 2*isolated SPI, 1*isolated UART, 4*isolated GPIO

Environmental conditions

Operating temperature	-20°C~55°C (temperature-rise limit 95°C, 85°Calarm threshold), storage temperature: -40°C~+70°C

Mechanical specifications and system requirements

Specification	155 × 105 × 24mm (±2mm); board thickness 1.6mm
System requirements	AGX：Ubuntu 22.04, Linux kernel 5.15+, Jetpack 6.0；MCU：freeRT OS V10.3.1+

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.

NVIDIA Jetson AGX Orin 64GB

CPU core number	12
CPU architecture	Arm Cortex-A78AE v8.2, 64-bit
CPU up to frequency	2.2 GHz
CPU cache	3MB L2 + 6MB L3
GPU architecture	NVIDIA Ampere
CUDA core number	2048
Tensor core number	64
GPU up to frequency	1.3 GHz
Module memory	64GB、256-bit LPDDR5
Memory bandwidth	204.8 GB/s
Module storage	64GB eMMC 5.1

NVIDIA Jetson AGX Orin 64GB (continued)

Deep learning acceleration unit	2×NVDLA v2
Vision acceleration unit	1×PVA v2
Module PCIe resources	PCIe Gen4, up to 2 × x8 + 1 × x4 + 2 × x1; specific multiplexed per design guide
Module can configured with power range	15–60 W
Module plane dimensions	100×87 mm
Module connector	699-pin Molex Mirror Mezz
H.265 en code capability example	2×4K60 / 4×4K30 / 8×1080p60 / 16×1080p30
H.265 de code capability example	1×8K30 / 3×4K60 / 7×4K30 / 11×1080p60 / 22×1080p30

05 COMPONENTS

Processor and device specifications (continued)

NVIDIA Jetson AGX Orin 64GB (continued)

Peak AI compute (INT8 sparse)	275 TOPS
Peak AI compute (INT8 dense)	138 TOPS
Module heat-spreader plate TTP temperature range	-25~80°C (standard 64GB module)

NVIDIA JetPack 6.0 (Software platform)

Jetson Linux version	36.3
Linux kernel baseline	5.15
File system baseline	Ubuntu 22.04
CUDA version	12.2.1
TensorRT version	8.6.2
CuDNN version	8.9.4
VPI version	3.1
DLA software version	3.14

Sources: NVIDIA, Jetson Orin Technical Specifications; NVIDIA, Delivering Server-Class Performance at the Edge with NVIDIA Jetson Orin; NVIDIA, Jetson AGX Orin Industrial comparison with 64GB module; NVIDIA, JetPack SDK 6.0 production release.

06 APPLICATIONS

From product capability to applications

Robot main compute node

Can uses Orin module run perception, fusion and task application, via network and USB attach external equipment, then by isolated serial and control unit switch status. Independent MCU handles equipment management related operation, main compute and management software boot, monitoring and fault response should integrates when together verification.

Multi sensing data fusion

Suited to via 10GbE and USB aggregation multi type sensing data, GPU and CPU resources on organize processing procedure. 275TOPS is module INT8 sparse peak metrics, actual model latency, accuracy and number input format, power consumption mode, memory access and software preferred affect, should per task measured.

Edge graphics processing equipment

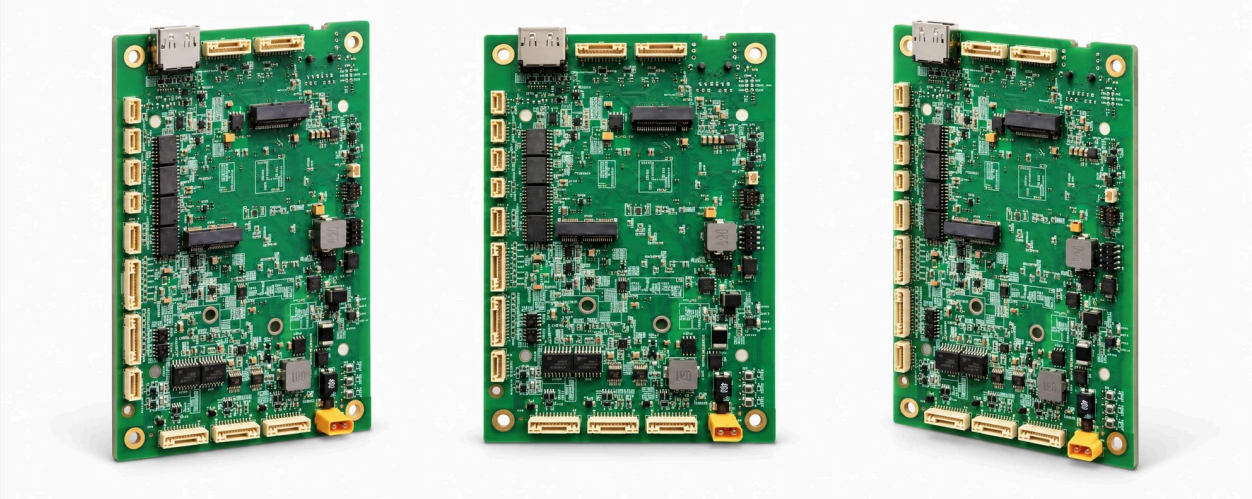
Can as inspection or edge graphics processing equipment compute basic, Ubuntu and JetPack environment run application, uses MCU connect management and status signal. Long time run when at the same time inspection 12V power capability, cooling conditions and temperature policy, reserved storage interfaces used also requires confirm specific configured with.

Integration checks

Compute aperture	275TOPS AGX Orin64GB INT8 sparse peak; not cannot write application measured or full accuracy unified compute.
I/O status	10GbE network, USB and already listed isolated RS-485 external port; M.2, CAN, I2C etc.list reserved, not default enable.
Power and temperature	12V±10%, power capability requirements≥120W; environment−20–55°C and 85°Calarm threshold not is the same metrics.
Software version	Website Ubuntu22.04, kernel 5.15+, JetPack6.0; MCU FreeRTOS10.3.1+, per delivery version check.

07 CONFIGURATION

Appearance, configuration and selection



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

Configuration

Uses 12V DC input, provides Ubuntu, JetPack and FreeRTOS software environment.

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

Email lyping@eqio.com Phone +86 182 8191 2988
Web eqio.com

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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