EQIO

PRODUCT MANUAL

PXIe Embedded Controller

PXIe-ZX6640MA

Zhaoxin KX-6640MA quad-core CPU · 3U 8HP system controller



Measurement and control, made easy.

EQIO.COM

Easy · Quick · Input · Output

01 OVERVIEW

x86 quad-core platform for central control of PXIe test systems

EQIO PXIe-ZX6640MA is a 3U PXIe system controller based on the Zhaoxin KaiXian KX-6640MA quad-core processor. It coordinates the modules in a PXIe chassis and manages the peripheral interfaces. The controller has 16 GB of DDR4 onboard, DP and VGA displays, Gigabit Ethernet, USB 3.0 / 2.0 and SMB trigger I/O, and runs Windows or Kylin OS.

3U · 8HP · PXIe



Product photo · shipped units may differ

4C / 4T
2.2 GHz base · 2.6 GHz max

16 GB
DDR4 onboard

PCIe 3.0
×8+×8 or 4 × ×4 links

4K@60Hz
DP output · plus VGA

Key features

- x86 architecture; Windows XP / 7 / 10 / 11 and Kylin OS
- Compact 3U 8HP design, weight ≤ 0.64 kg
- SMB trigger I/O and PXI trigger bus
- DP + VGA; DP up to 3840 × 2160 at 60 Hz
- Gigabit Ethernet, 2 × USB 3.0, 2 × USB 2.0, COM
- 0–55 °C, 5–95% RH non-condensing

02 PROCESSOR

Zhaoxin KaiXian KX-6640MA

KX-6000 SERIES · LUJIAZUI MICROARCHITECTURE · 16 NM

The KX-6640MA is a Zhaoxin KaiXian KX-6000 series SoC. It integrates the memory controller, PCIe 3.0, C-960 graphics, USB and SATA with no external chipset, and runs 32 / 64-bit x86 software, including Windows, Kylin OS and existing test programs.

Core specifications

Family	Zhaoxin KaiXian KX-6000
Architecture	LuJiaZui
Process	16 nm
Cores / threads	4 / 4
Base clock	2.2 GHz
Max. turbo	2.6 GHz
TDP	25 W

Cache, memory and I/O

L1 data cache	32 KB per core
L2 cache	4 MB, no L3
Memory	DDR4-2666, dual channel
PCIe	PCIe 3.0, up to 16 lanes
Graphics	C-960, DirectX 11 / OpenGL 3.2
Video	4K hardware decode
Extensions	x86-64, SSE4.2, AVX, AES, SHA, VT-x

8.8 core·GHz
4 cores × 2.2 GHz

4 MB
L2 cache

25 W
TDP, suits PXIe slot cooling

> **Public benchmark reference**
>
> Geekbench 6 public database (Lenovo Zhaoyang N4620Z laptop): 386 single-core and 1110 multi-core, similar to an AMD FX-4100. Third-party laptop results indicating performance class only; not measured on this controller, no real-time guarantee.

Platform highlights

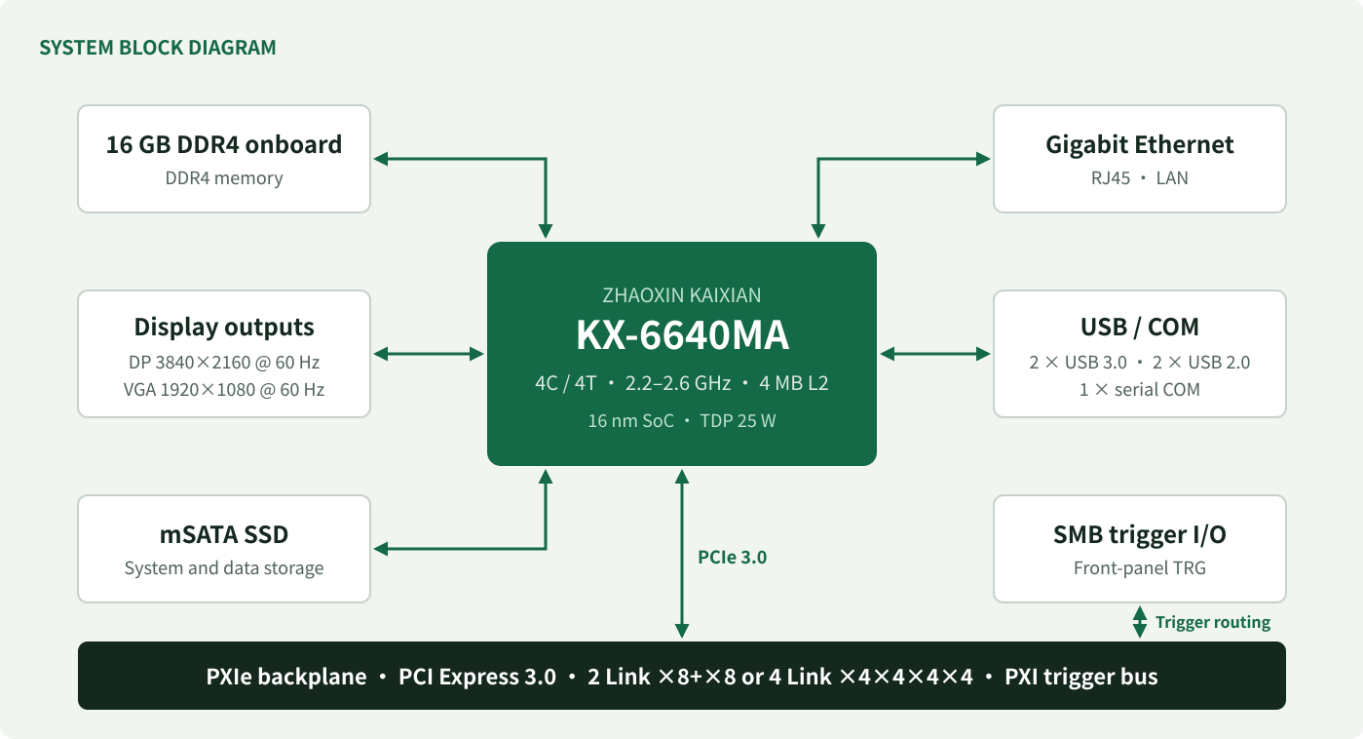
x86 compatible
Reuse x86 test software

OS choice
Windows or Kylin OS

Single-chip SoC
Highly integrated, compact

03 ARCHITECTURE & I/O

One controller, connected to the whole system



Drawn from the published configuration to show data paths; it does not represent the internal circuit design.

Front panel



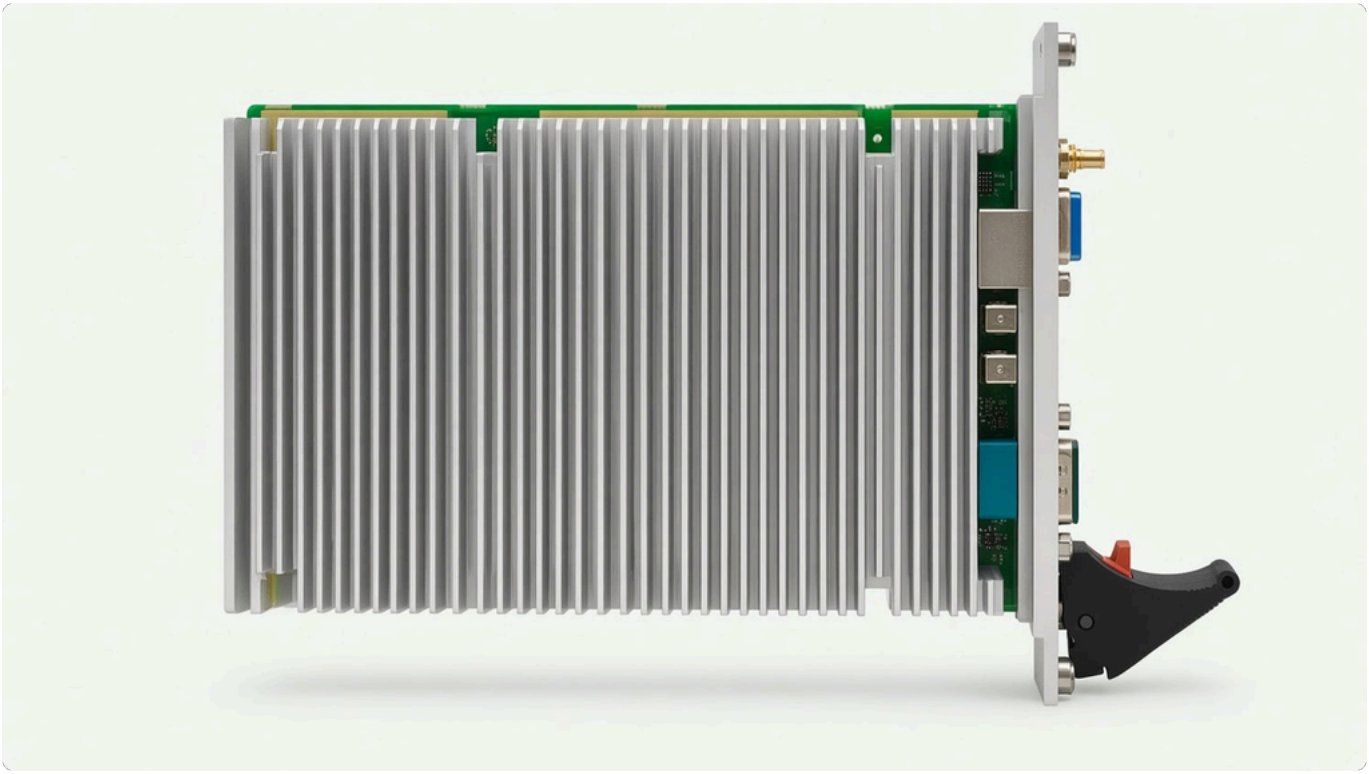
Front view · rendering

TRG	SMB trigger input / output
RST	System reset
LAN	Gigabit Ethernet, RJ45
VGA	DB15, up to 1920 × 1080 @ 60 Hz
USB1–USB4	USB1/2: USB 2.0; USB3/4: USB 3.0
COM	DB9 serial port
DP	DisplayPort, up to 3840 × 2160 @ 60 Hz
USER / PWR / HDD	User, power and disk LEDs
Ejector	Insertion, extraction and locking

Labels follow the product photos. COM ratings and batch differences follow the order confirmation.

04 DESIGN & INSTALLATION

Compact 3U 8HP design, full aluminum



Left view (rendering): a large finned aluminum heatsink covers the main components.

Mechanical and environment

Form factor	3U PXIe system controller
Width	8HP (about 40.6 mm): system slot plus one controller expansion slot
Weight	≤ 0.64 kg
Cooling	Finned aluminum heatsink, chassis forced air
Operating temp.	0–55 °C
Humidity	5–95% RH, non-condensing
Mounting	Captive screws and ejector

Installation

- Power off the chassis first
- Insert into slot 1 along the guide rails
- Seat with the ejector, tighten the screws
- Keep vents clear, fit blanks in free slots
- At first boot, check memory, SSD and PCIe

3U
PXIe system controller

8HP
About 40.6 mm wide

≤ 0.64 kg
Weight

0–55 °C
Operating temperature

05 SPECIFICATIONS

Technical specifications

From the published configuration; final details follow the order confirmation.

Processor

Model	Zhaoxin KaiXian KX-6640MA
Architecture	LuJiaZui, 16 nm, x86-64
Cores	4 cores / 4 threads
Clock	2.2 GHz base, up to 2.6 GHz
Cache	L2 4 MB
TDP	25 W

Memory, storage and OS

Memory	16 GB DDR4 onboard
Storage	mSATA SSD
OS	Windows XP / 7 / 10 / 11 or Kylin OS

Display

DP	Up to 3840 × 2160 @ 60 Hz
VGA	Up to 1920 × 1080 @ 60 Hz
Graphics	C-960, DirectX 11 / OpenGL 3.2

PXIe bus

Standard	PCI Express 3.0, compatible with 2.0 / 1.1
Link options	2 Link ×8+×8 or 4 Link ×4×4×4×4

I/O

Ethernet	1 × Gigabit Ethernet (RJ45)
USB	2 × USB 3.0, 2 × USB 2.0
Serial	1 × COM (DB9)
LEDs	USER / PWR / HDD
Button	RST reset

Trigger and sync

External	SMB trigger input / output
PXI trigger	PXI trigger bus supported

Mechanical and environment

Form factor	3U, 8HP
Weight	≤ 0.64 kg
Operating temp.	0–55 °C
Humidity	5–95% RH, non-condensing

> **Selection reference (derived values)**
>
> Nominal CPU capacity: about 8.8 core·GHz (4 cores × 2.2 GHz)
> PCIe 3.0 ×8 after line encoding: about 7.88 GB/s per direction (theoretical)
> Derived from published core counts, clocks and the PCIe formula, excluding protocol, DMA and software overheads. Not a benchmark or a real-time or throughput guarantee.

06 SYSTEM & APPLICATIONS

From controller to complete PXIe test system



System integration (rendering): controller in system slot 1; other slots hold measurement and I/O modules.

Typical system

01

PXIe-ZX6640MA controller

Runs the OS and test software; coordinates modules

02

PXIe chassis and backplane

Power, cooling, PCIe links and trigger bus

03

Measurement and I/O modules

Acquisition, instruments, control, actuation

Applications

Manufacturing

Production line testing

Energy and power

Power and storage systems

Automotive

Validation and bench tests

Research

Lab measurement, teaching

Aerospace

Ground test and recording

Metrology

Calibration and comparison

07 CONFIGURATION

Configuration, options and selection

Standard configuration

- 3U 8HP PXIe system controller
- KX-6640MA, 16 GB DDR4 onboard
- DP / VGA, Ethernet and USB

Options and accessories

- OS version and site image
- Display, trigger and chassis cables
- PXI / PXIe modules, integration

Selection guide

Chassis	Needs a PXIe system slot plus one controller expansion slot (8HP)
Link planning	Match the backplane to 2 Link ×8+×8 or 4 Link ×4×4×4×4
Operating system	Windows XP / 7 / 10 / 11 or Kylin OS, by driver and software support
Storage	Size the mSATA SSD for the system image and data logging
Triggering	Use SMB TRG and the PXI trigger bus to sync external equipment
Environment	0–55 °C, 5–95% RH non-condensing; ask us about other conditions

Related PXIe controllers

Phytium D2000/8
Arm64 platform

Loongson 3A6000
LoongArch platform

Zhaoxin KX-6000G
x86 platform

Quotes and selection support

Product page eqio.com/en/product/eq-pxie-zx6640ma
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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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