EQIO

PXIe-LS3A6000

PRODUCT MANUAL

3U Loongson 3A6000 PXIe Controller

Loongson 3A6000, 4 physical core / 8 logic core



Measurement and control, made easy.

Easy · Quick · Input · Output

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01 OVERVIEW

3U Loongson 3A6000 PXIe Controller

PXIe controller · Automation test · Data processing · Equipment measurement and control · PXI Express · Loongson

PXIe-LS3A6000 uses Loongson 3A6000 4-core processor and 7A2000 bridge chip, supports DDR4 memory, system bandwidth rated up to 16GB/s, provides VGA, HDMI, USB, network and trigger I/O, used for PXIe test and data processing system.
Gigabit Ethernet, USB, HDMI and VGA field operation and device communications provides connect, mSATA location used for system storage. SMB I/O external trigger connect to PXI trigger bus, can and acquisition and measurement module combination, build modular industrial test host.



Product appearance reference; shipped units may differ.

Key features

- Loongson 3A6000 4-core eight threads
- 7A2000 matching bridge chip
- Up to 32GB DDR4 configured with
- HDMI, VGA and Gigabit Ethernet
- PCIe3.0 and SMB trigger I/O

02 FUNCTIONS

Functions and engineering value

4-core eight threads control platform

Controller uses Loongson 3A6000 four physical eight-core logic threads processor and 7A2000 bridge chip, supports up to 32GB DDR4. Product Kylin OS software environment, for centralized run measurement and control task, module management and data processing PXIe system, software adapts requires combined with processor architecture confirm.

PXIe and external trigger

System side provides PCIe3.0 connect and dual link, four link two types configured with, website system bandwidth rated up to 16GB/s. SMB I/O external event and PXI trigger bus relationship, selection when respectively confirm data channel, trigger method and backplane assign, not cannot only per peak bandwidth calculate task rate.

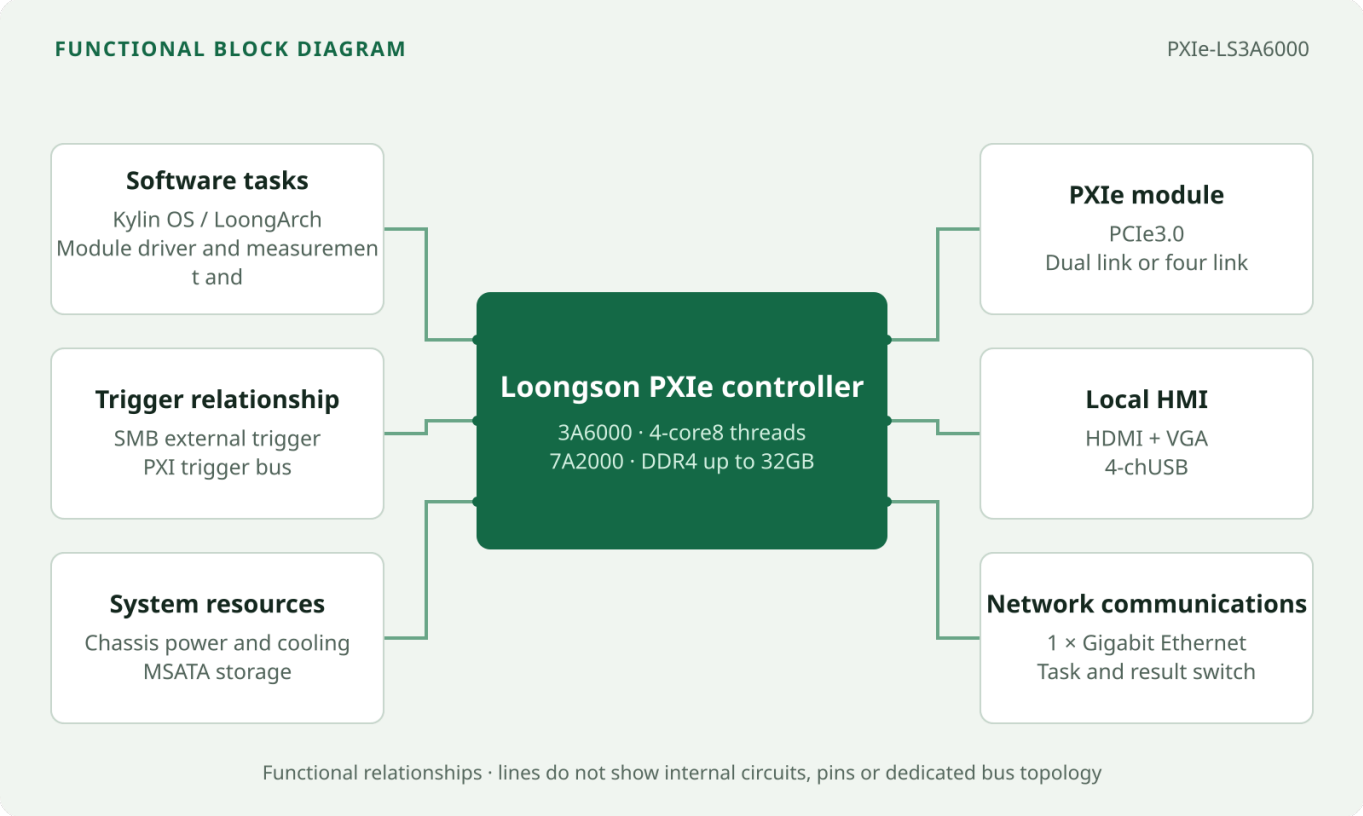
Field display and peripheral attach

HDMI and VGA responsible for local display, Gigabit Ethernet and 4-ch USB facilitates connect on grade system and operation peripherals, mSATA used for system and data storage. Website provides 16GB memory plus 1TB SSD solution, 3U 8HP structure requires system slot and 1 controller expansion slot space.

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



Function relationship illustration, based on website product configured with compiled; not indicates actual on-board routing, bridge chip connect or I/O exclusive bandwidth.

Platform and I/O

Loongson 3A6000 handles compute task, 7A2000 provides matching bridge and graphics etc.resources, website product uses four physical eight-core logic threads configured with. CPU and bridge chip native resources only device specification section expand, controller section used actual HDMI, VGA, network, USB and PXIe I/O parameters.

> **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	Loongson 3A6000, 4 physical core/8 logic core clock 2.0~2.5G Hz
Memory	Supports up to 32GB DDR4; configured with 16GB memory + 1TB SSD
Chip group	Loongson 7A2000 bridge chip
Display interfaces	1×VGA，1×HDMI
Bus	PCI Express 3.0 (compatible PCI Express 2.0 and PCI Express 1.1)
PXIe link configuration	2 Link Mode: ×8、×8 4 Link Mode: ×4、×4、×4、×4
System bandwidth	Up to up to 16 GB/s

I/O and expansion

Storage	1 mSATA I/O SSD
Ethernet	1 Gigabit Ethernet I/O
USB	2 × USB 3.0，2 × USB 2.0
Trigger I/O	Front panel installation SMB connector, used for external trigger signal attach / brought out PXI trigger bus

Environmental conditions

Slot requirements	1 system slot additional 1 controller expansion slot
Operating temperature	0 °C ~ 55 °C
Storage temperature	-20 °C ~ 70 °C
Relative humidity	5% ~ 95%, non-condensing

Mechanical specifications and system requirements

Module size and weight	3U 8HP PXI Express, weight≤0.64kg
Operating system	Kylin OS operating system

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.

Loongson Chinese Academy 3A6000

ISA	LoongArch
Physical core number	4-core
Logic processor number	8 threads
Processor core	64-bitLA664, 6-issue out-of-order actuation
Frequency	2.0–2.5GHz
Vector unit	128-bit and 256-bit
Per core layer-1 command cache	64 KB/core
Per core layer-1 data cache	64 KB/core
Per-core private has layer-2 cache	256 KB/core
Shared L3 cache	16 MB
Memory controller	2-ch72-bitDDR4-3200, supports ECC

Loongson Chinese Academy 3A6000 (continued)

High-speed bridge chip interconnect	1-chHyperTransport 3.0
Native low-speed I/O	1-chSPI, 1-chUART, 2-chI2C, 16-chGPIO
Package	BGA, 35 × 35mm, 1190 pins
Typical power consumption	38W@2.5GHz
Dual accuracy peak compute	240 GFLOPS

Loongson Chinese Academy 7A2000 bridge chip

Device role	CPU matching bridge chip, integrates 3D graphics unit
Processor connect	HyperTransport 3.0 x16, vendor rated 6.4Gbps
Graphics capability	Integrates 3D GPU

05 COMPONENTS

Processor and device specifications (continued)

Loongson Chinese Academy 7A2000 bridge chip (continued)

Native PCIe resources	32 item PCIe Gen 3-channel
Native SATA	4-chSATA 3.0
Website native USB resources	4-chUSB 3.0, 8-chUSB 2.0
Native display interfaces	2-chHDMI, 1-chVGA
Other native I/O	SPI, LPC, 6-chI2C, 4-chCAN, UART, GPIO

Sources: Loongson Chinese Academy, Loongson 3A6000 product parameters; Loongson Chinese Academy, Loongson 7A2000 bridge chip product parameters.

06 APPLICATIONS

From product capability to applications

Loongson measurement and control software platform

Can as Loongson software environment in PXIe system host, Kylin OS on run measurement and control application and management I/O board. Already has application migrate when, should confirm LoongArch platform software build, library depends on and driver supports, not cannot only from operating system name same determine program can directly run.

Multi module data processing

Can acquisition module data aggregation to controller performs organize and processing, again via local storage or network provides result. 4-core eight threads describe is processor actuation resources, actual task and throughput still depends on to application implements, module rate and backplane connect, required around specific data path evaluate.

Equipment bring-up operation unit

Suited to modular operation in the unit combination measurement, communications and trigger board, HDMI or VGA display bring-up UI, via USB attach operation peripherals. Requires relationship external event when, can SMB trigger include solution, and stated each module trigger electrical conditions and software response method.

Integration checks

Software architecture	Kylin OS and LoongArch application environment; item by item confirm driver, toolchain and measurement and control software supports.
Product configured with	Up to 32GB DDR4, website 16GB plus 1TB SSD solution; 3A6000 clock 2.0–2.5G Hz per configured with confirm.
Bandwidth aperture	Retain website up to 16GB/s and link configured with, not write has peripheral slot at the same time can up to continuous speed.
I/O and environment	HDMI/VGA, 1-ch Gigabit network, 4-chUSB; 0–55°Coperation, required system slot and 1 expansion slot.

07 CONFIGURATION

Appearance, configuration and selection



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

Configuration

Provides 16GB memory plus 1TB SSD solution, uses Kylin OS system, occupancy 1 system slot and 1 controller expansion slot.

Configured with	16GB memory + 1TB SSD

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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