EQIO

VPX-2K1000

PRODUCT MANUAL

6U Loongson 2K1000 VPX System Controller

Loongson 2K1000 dual core processor (GS264)



Measurement and control, made easy.

Easy · Quick · Input · Output

EQIO.COM

01 OVERVIEW

6U Loongson 2K1000 VPX System Controller

VPX system controller · Communications equipment · Electrical power automation · Embedded control · VPX · Loongson

VPX-2K1000 uses Loongson 2K1000 dual core processor, onboard 4GB DDR3 and supports expansion, provides dual Gigabit Ethernet, display, serial, GPIO and CAN bus resources, supports SylixOS system.
Dual Gigabit Ethernet connect field equipment and control network, VGA, USB and composite serial facilitates local HMI. 8-ch GPIO and 4-ch CAN used for signal and bus attach, board suited to VPX chassis in handles data aggregation, device communications and industrial control task.



Product appearance reference; shipped units may differ.

Key features

- Loongson 2K1000 dual core platform
- Onboard 4GB DDR3
- Dual Gigabit RJ45 I/O
- 8-ch GPIO and 4-ch CAN
- VGA, USB and composite serial

02 FUNCTIONS

Functions and engineering value

Dual core industrial communications controller

Loongson 2K1000 dual core platform 800MHz to 1GHz run, onboard 4GB DDR3 and supports expansion to 8GB, matching base to PMON improve Kylin firmware. Product lists SylixOS supports, application and equipment driver should per should processor architecture and specific system version completes adapts.

Multi type field bus attach

Dual Gigabit RJ45, 4-ch CAN, 8-ch GPIO and multiplexed RS-232/RS-422 I/O, field device connection provides multi type path. Each signal signal level, terminal and isolated requirements required and connected equipment check, multiplexed serial per selected mode used, not cannot count 2-ch independent application channel.

Display and storage expansion

VGA can used for 1080p equipment UI, USB connect local peripherals, SATA and PCIe resources can used for storage and expansion equipment solution. 10GbE SFP+belongs to optional configuration, 1TB SSD should also per actual delivery confirm, not can be expansion capability inferred has equipment already with board installation.

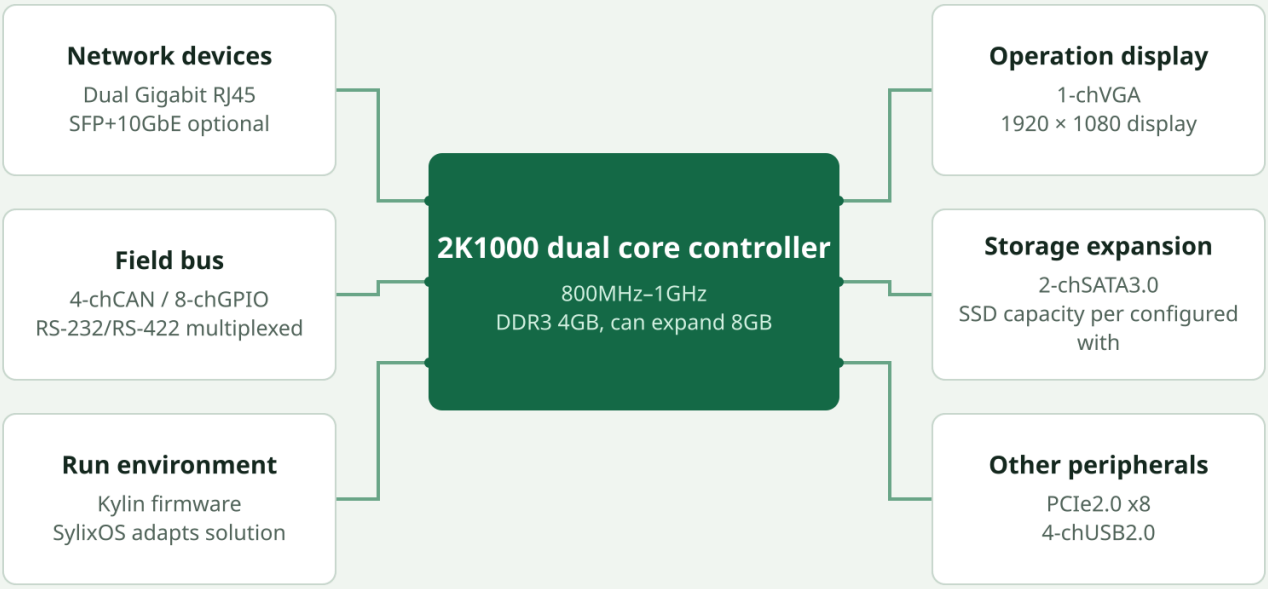
The functional notes explain the product’s role from published configuration. Optional functions, software and peripherals follow the project definition. Chip capability is not the same as implemented I/O.

03 ARCHITECTURE

Platform and functional relationships

FUNCTIONAL BLOCK DIAGRAM

VPX-2K1000



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

Based on board-level published specification show functional relationship; multiplexed serial and optional SFP+required independent confirm, not indicates on-board bus implements or real-time performance guarantee.

Platform and I/O

2K1000 includes 2 GS264 processor core, uses MIPS compatible 64-bit architecture; this board configured with 4GB DDR3 and lists 8GB expansion capability. Platform matching PMON derived firmware and SylixOS, function resources highlight dual Gigabit, CAN and GPIO, 10GbE optical port and storage capacity per option solution processing.

> **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	Loongson 2K1000 dual core processor, clock 800MHz-1GHz, on-chip integrates 2 GS264 processor core
System memory	Onboard 4GB DDR3, supports expansion to 8GB
BIOS	Kylin firmware (base to PMON improve)
Operating system	Supports Yihui operating system SylixOS

Environmental conditions

Operating temperature	-40°C–70°C (operating temperature), -50°C ~ 90°C (storage temperature)
Relative humidity	40°C @ 95% relative humidity, non-condensing

I/O and expansion

USB	4 USB I/O, compatible USB1.1 and USB2.0
Storage	SATA3.0 × 2, 1TB SSD (SATA I/O) expansion
Serial	1-ch RS-232/RS-422 (multiplexed I/O)
Display interfaces	1-chVGA, supports 1920 × 1080 resolution
Network interfaces	Dual Gigabit Ethernet (RJ45 × 2, LAN1/LAN2), optional 10GbE optical port (SFP+)
Expansion I/O	1-chPCIe2.0 × 8
DIO/MIO	Supports 8-chGPIO, supports CAN bus × 4

Mechanical specifications and system requirements

Specification	233.3mm × 160mm, weight 0.45kg±0.01

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 2K1000

Physical core number	2-core
Processor core	GS264
ISA family	64-bitMIPS
Micro system structure	Dual issue, out-of-order actuation, 10 grade stream waterline
Clock	1 GHz
Process	40 nm
Memory controller	64-bitDDR3 controller
Series native high-speed I/O	2-chPCIe 2.0, 1-chSATA 2.0
Series native display and USB	2-chDVO, 4-chUSB 2.0
Power consumption	Typical 3.5W, maximum 5W

Sources: Loongson Chinese Academy, Loongson 2K1000 industrial control solution vendor report; Loongson Chinese Academy, Loongson 2K1000 education kit vendor report; Loongson Chinese Academy, Loongson 2K1000LA processor stream chip into function, Loongson application full face transfer toward LoongArch architecture; GNU binutils upstream project, GNU binutils upstream commit: MIPS Add Loongson2K1000 processor support.

06 APPLICATIONS

From product capability to applications

Field device communications management

Dual Gigabit Ethernet and multi-channel CAN suited to network devices, bus equipment and control signal aggregation to the same controller node. SylixOS provides should software run basic, specific protocol, task priority and control response requires via application and driver verification, not can directly claim determine latency.

Electrical power equipment status acquisition

CAN, GPIO and serial can used for status data and control information attach, VGA can provides field maintenance video. Project should follow field signal level and isolated requirements matching wiring and protection, log data when optional corresponding SATA storage; product industry suited usability and test should separately confirm.

Modular embedded control node

Match 6U VPX chassis in, can uses PCIe expansion supplement required function, and network and serial connect external control unit. If required need 10GbE communications, should stated SFP+option, driver and optical module, with rear verification backplane compatible, load power consumption and wide temperature run conditions.

Integration checks

Software architecture	2K1000 MIPS compatible platform, check SylixOS, Kylin firmware and driver version, not used LoongArch image replace.
Communications mode	RS-232/RS-422 multiplexed I/O; confirm 4-ch CAN and GPIO signal level, wiring, terminal and isolated configured with.
Optional assembly	SFP+10GbE optical port option, SSD capacity and DDR3 from 4GB extended to 8GB all require per delivery configured with confirm.
Mechanical and temperature	Check 233.3 × 160mm board outline, 0.45kg typical weight and backplane definition, and verification−40–70°Ccooling conditions.

07 CONFIGURATION

Appearance, configuration and selection



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

Configuration

Provides storage expansion and optional SFP+10GbE optical port solution, supports SylixOS system.

Network	Dual Gigabit; optional SFP+10GbE optical port

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

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