EQIO

PRODUCT MANUAL

PXIe Embedded Controller

PXIe-FTD2000

Phytium D2000/8 8-core CPU · X100 companion chip · 3U 8HP



Measurement and control, made easy.

Easy · Quick · Input · Output

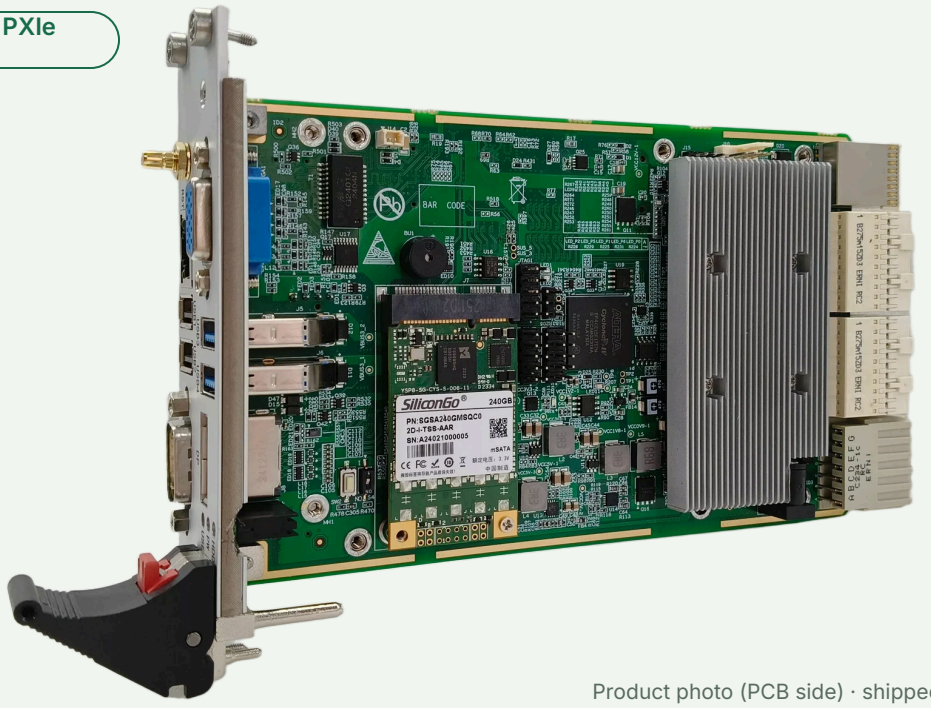
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01 OVERVIEW

Eight-core Arm platform for hybrid PXI / PXIe test systems

EQIO PXIe-FTD2000 is a 3U PXIe system controller built on the Phytium Tengrui D2000/8 eight-core processor and the Phytium X100 companion chip. It schedules tasks and manages the modules in a PXIe chassis. The controller has 16 GB of DDR4 onboard, VGA and DP displays up to 3840 × 2160 at 60 Hz, Gigabit Ethernet, USB 3.0 / 2.0 and SMB trigger I/O, and runs Kylin OS.

3U · 8HP · PXIe



Product photo (PCB side) · shipped units may differ

8 cores
FTC663 · 2.0–2.3 GHz

16 GB
DDR4 onboard

8 GB/s
Max. system bandwidth

4K@60Hz
DP output · plus VGA

Key features

- ARMv8 architecture with Kylin OS support
- X100 chip adds GPU, 4K video decode and I/O
- Compact 3U 8HP design, weight ≤ 0.64 kg
- PCIe 3.0 system links: ×8+×8 or 4 × ×4
- Gigabit Ethernet, 2 × USB 3.0, 2 × USB 2.0
- SMB trigger I/O, PXI trigger bus, 0–55 °C

02 PROCESSOR

Phytium Tengrui D2000/8

8 × FTC663 CORES · ARMV8 · 34 LANES PCIE 3.0

The Tengrui D2000/8 is Phytium's eight-core processor for desktop and high-end embedded use. Its eight FTC663 cores are ARMv8-compatible (64 / 32-bit), with hardware virtualization and the PSPA 1.0 security architecture. The D2000 has no integrated graphics; the X100 companion chip provides display, video decoding and peripheral expansion.

Core specifications

Family	Phytium Tengrui D2000
Cores	8 × FTC663
ISA	ARMv8, 64 / 32-bit
Clock	2.3 GHz standard / 2.0 GHz industrial
Process	14 nm (public reports)
TDP	40 W standard / 38 W industrial
Package	FCLBGA, 35 × 35 mm

Cache, memory and I/O

L2 cache	8 MB, 2 MB per 2-core cluster
L3 cache	4 MB
Memory	2 × DDR4 controllers
PCIe	34 lanes PCIe 3.0
Ethernet	2 × Gigabit Ethernet MAC
Hypervisor	KVM / Xen
Security	PSPA 1.0; SM2 / SM3 / SM4 / SM9

Source: Phytium Tengrui D2000 Series Processor Datasheet. TDP is the maximum average linpack power at maximum junction temperature. The processor grade fitted is stated in the order confirmation.

8 × 2.3 GHz
Industrial grade: 2.0 GHz

12 MB
8 MB L2 + 4 MB L3

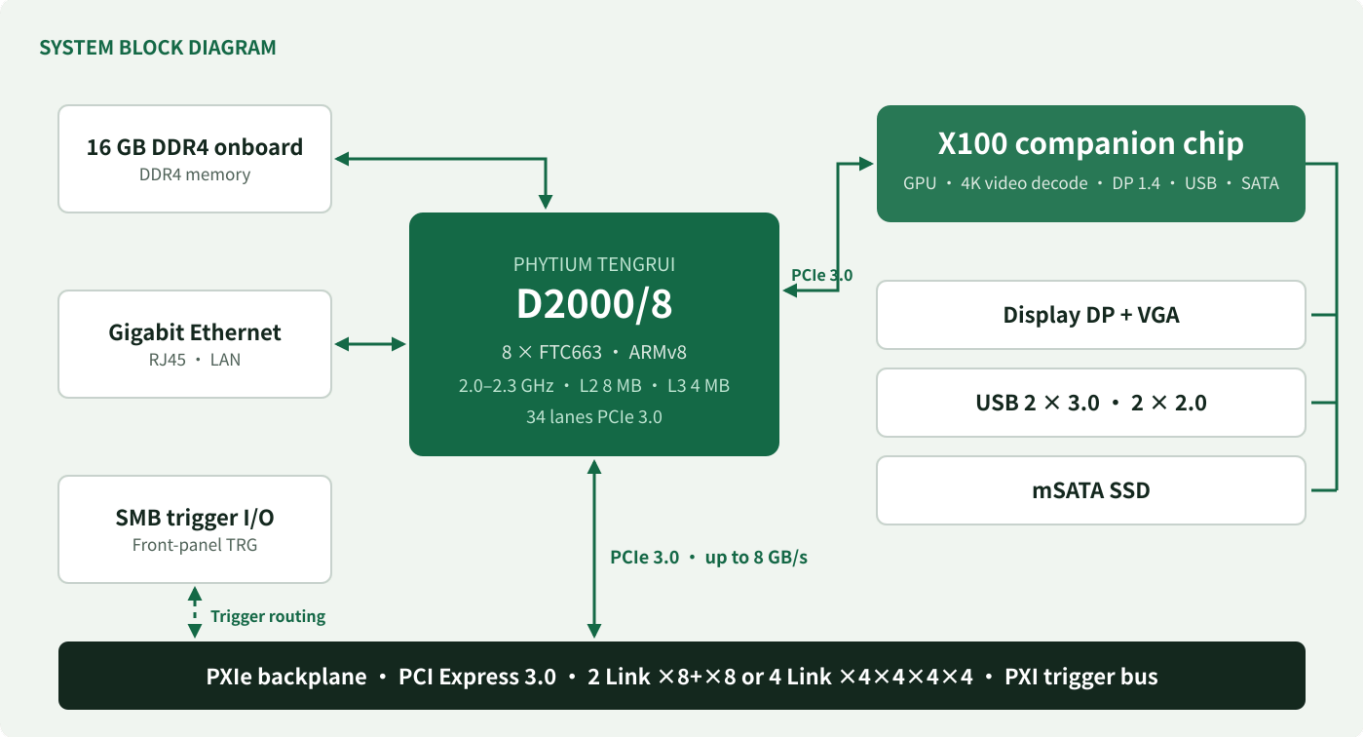
34 lanes
PCIe 3.0 on the CPU

Phytium X100 companion chip

The X100 integrates a GPU (600 MHz, about 300 GFLOPS) and a 4K30 video decoder (H.264 / H.265 / MPEG-4 / MPEG-2), drives three DisplayPort 1.4 outputs (two at 3840 × 2160 @ 60 Hz) and adds PCIe 3.0, 4 × SATA 3.0 and 8 × USB 3.1 Gen 1.
Ports on this controller follow its front panel and the order confirmation.

03 ARCHITECTURE & I/O

CPU and X100, connected to the whole system



Drawn from public Phytium D2000 / X100 data and the published configuration. It shows data paths, not the internal circuit design.

Front panel



Front view · rendering

TRG	SMB trigger input / output
RST	System reset
LAN	Gigabit Ethernet, RJ45
VGA	DB15 analog display output
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

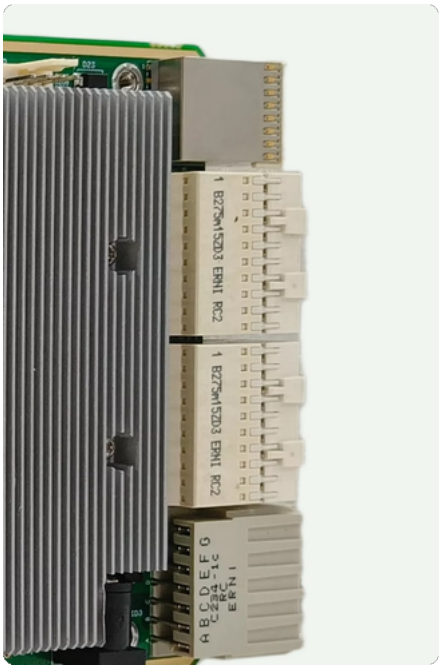
Labels follow the official front-panel image and photos. COM ratings and batch differences follow the order confirmation.

04 DESIGN & INSTALLATION

Compact 3U 8HP design, finned heatsink



Front panel: SMB trigger, VGA, USB



Rear: PXIe backplane connectors



mSATA SSD (capacity per order)

Details from the official product photo (PCB side); shipped units may differ.

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 CPU 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
- Slide the controller into slot 1 along the guide rails
- Press the ejector to seat the connectors, then tighten both screws
- Keep vents clear and fit blanks in empty slots
- At first boot, check memory, storage and PCIe links in the BIOS and Kylin OS

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	Phytium Tengrui D2000/8
Architecture	8 × FTC663 cores, ARMv8
Clock	2.0–2.3 GHz (by grade)
Cache	L2 8 MB, L3 4 MB
Companion chip	Phytium X100

Memory, storage and OS

Memory	16 GB DDR4 onboard
Storage	mSATA SSD interface
OS	Kylin OS

Display

Interfaces	VGA + DP
Max. resolution	3840 × 2160 @ 60 Hz
Graphics	X100 GPU, 4K hardware video decode

Trigger and sync

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

PXIe bus

Standard	PCIe 3.0, compatible with 2.0 / 1.1
Link options	2 Link ×8+×8 or 4 Link ×4×4×4×4
Bandwidth	Up to 8 GB/s

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

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 16–18.4 core·GHz (8 cores × 2.0–2.3 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-FTD2000 controller

Runs Kylin 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

Automated test

Multi-module test systems

Manufacturing

Production line testing

Energy and power

Power and storage systems

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
- D2000/8 CPU and X100 chip
- 16 GB DDR4 onboard, mSATA

Options and accessories

- Kylin 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
Software	Confirm that test software, drivers and modules support Arm64 and Kylin OS
CPU grade	2.0–2.3 GHz depending on grade; confirm when ordering
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

Loongson 3A6000
LoongArch platform

Zhaoxin KX-6000G
x86 platform

Zhaoxin KX-6640MA
x86 quad-core

Quotes and selection support

Product page eqio.com/en/product/eq-pxie-ftd2000
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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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