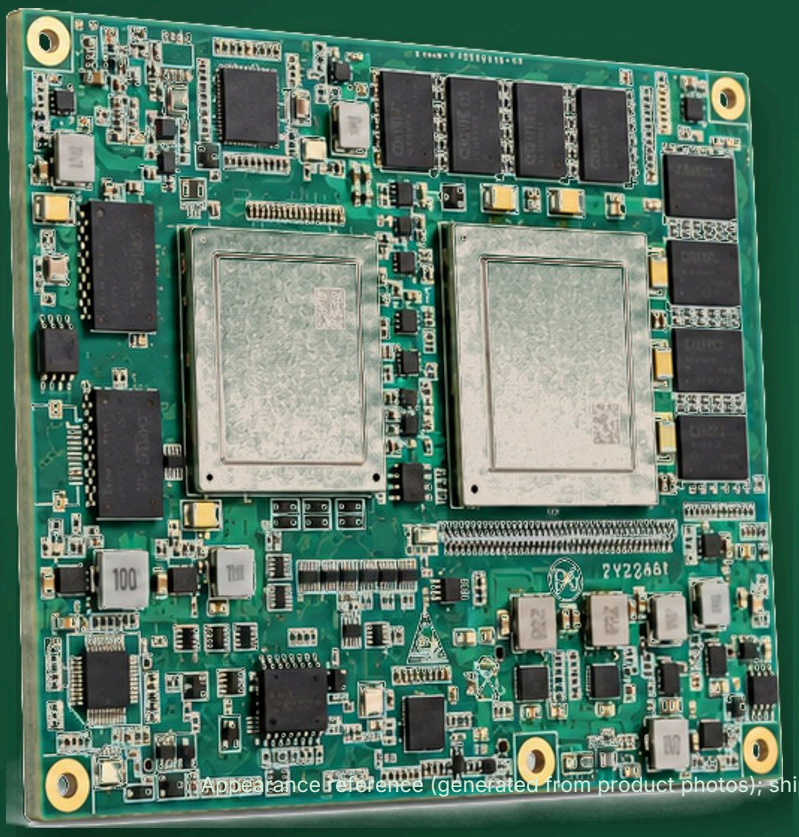
EQIO

COMe-D2000

PRODUCT MANUAL

Phytium D2000 COM Express Type 6 Module

Phytium D2000 8-core processor



Appearance reference (generated from product photos); shipped units may differ.

Measurement and control, made easy.

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01 OVERVIEW

Phytium D2000 COM Express Type 6 Module

COM Express compute module · Industrial control · Rail transit · Embedded terminal · COM Express · Phytium

COMe-D2000 uses Phytium Tengrui D2000/8 and X100 bridge chip, onboard DDR4 memory, provides PCIe, display, storage and industrial peripheral I/O, supports Kylin OS and UOS etc.operating system, used for COM Express carrier on core compute integrates.
Gigabit Ethernet, USB, TTL serial, GPIO and CAN via carrier connect external equipment, VGA and dual DP used for display output. Module compute and I/O resources centralized layout, suited to equipment controller, HMI and industrial data acquisition system.



Product appearance reference; shipped units may differ.

Key features

- Phytium D2000 8-core and X100 bridge chip
- Up to 16GB soldered DDR4
- VGA and dual DP display connection
- 3-ch SATA3.0 storage interfaces
- USB, GPIO, serial and CAN

02 FUNCTIONS

Functions and engineering value

8-core compute and I/O expansion

D2000 8-core processor together with X100 bridge chip, COM Express module on provides compute, graphics and peripheral connection resources. Industrial grade 2.0GHz and commercial grade 2.3GHz different solution, selection when clock, memory capacity and environment etc.grade and fixed, avoid two kinds of configured with combined and the same standard.

Carrier side high-speed resources configured with

Module lists PCIe x16 and multi-channel x1 connect, allow per specified mode split narrower link, can for acquisition or communications expansion card planning carrier. 3-ch SATA3.0 and optional BGA SSD provides different storage path, actual channel combination and boot method should combined with carrier design and firmware confirm.

Display and industrial peripherals organize

VGA and dual DP can used for operation and status display, Gigabit Ethernet, USB and GPIO handles device connection. 2-ch CAN and 2-ch TTL storage jumper select relationship, therefore bus solution should circuit design front determine; TTL signal via required transceiver circuit rear only then connect uses other signal level standard field equipment.

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

Compute platform and functional relationships

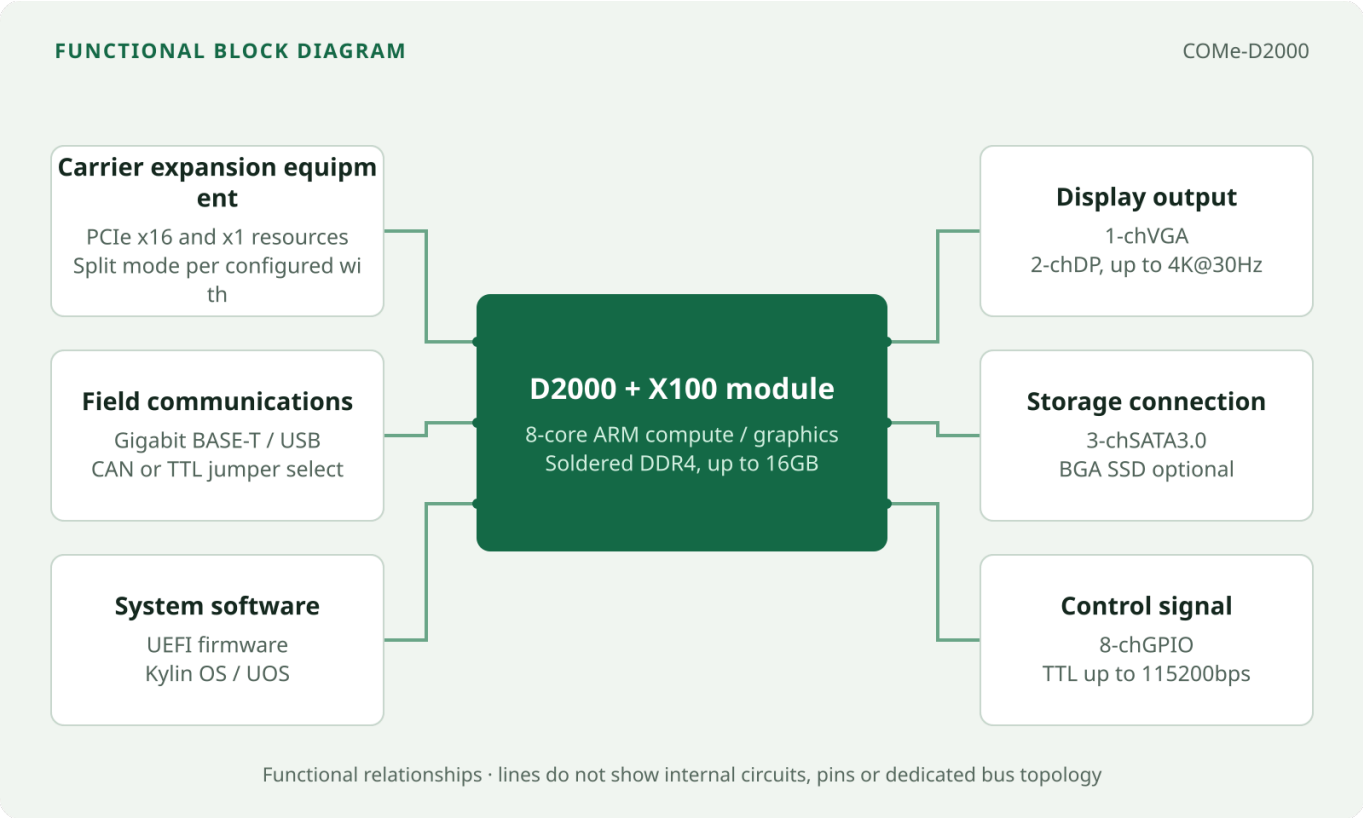


Illustration published function resources relationship, not indicates D2000 and X100 actual on-board connect; CAN/TTL and PCIe split all require per option solution confirm.

Platform and I/O

D2000 provides 8 FTC663 processor core and ARMv8 actuation capability, X100 handles graphics and I/O expansion role. Product up to 16GB soldered DDR4, display, storage and industrial peripherals resources organize to Type6 module, board-level channel quantity and display specification product definition shall prevail, not per processor native resources directly external infer.

> **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	Tengrui D2000/8, 8-core, industrial grade clock 2.0GHz; commercial grade clock 2.3GHz, Phytium X100 bridge chip
System memory	Soldered DDR4 memory, maximum 16GB
Display	Integrates GPU X100
BIOS	UEFI firmware
Operating system	Kylin OS, UOS etc.

Environmental conditions

Operating temperature	-40°C ~ 65°C (operating temperature), -40°C ~ 85°C (storage temperature)
Humidity	5%~95%humidity non-condensing

Mechanical specifications and system requirements

Specification	125mm×95mm

I/O and expansion

USB	4-chUSB 3.0, 4-chUSB 2.0
DIO/MIO	8-chGPIO, can configured with input or output, 2-chCAN 2.0 I/O (and 2-chTTL jumper select)
Serial	2-chTTL serial, maximum baud rate 115200 bps
Display interfaces	1-chVGA output, maximum resolution 1920*1080@60Hz; 2-chDP output, maximum resolution 3840*2160@30Hz
Network interfaces	1-ch Gigabit BASE-T I/O
Storage interfaces	3-chSATA 3.0 I/O, reserved 1 BGA SSD, supports 120GB-512GB capacity
Expansion slots	1-chPCIe3.0 × 16 (can split into 2 × 8), 8-chPCIe3.0 × 1 (front 4-ch × 1 can consists of 2-ch × 2)

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.

Phytium D2000

Processor core count	8-core
Processor micro architecture	FTC663
ISA and actuation mode	ARMv8; supports ARM64 and ARM32 actuation mode
Up to clock	2.3 GHz
Layer-2 cache	8 MB
L3 cache	4 MB
CPU memory controller	2 DDR4 I/O
CPU PCIe resources	34 lanes PCIe 3.0
CPU network controller	2 Gigabit Ethernet I/O
Other on-chip I/O	1 × SD2.0, 4 × UART, 32 × GPIO, 4 × I2C, 1 × QSPI, 2 × general-purpose SPI, 3 × CAN, 2 × WDT, 16 × external interrupt

Phytium D2000 (continued)

Hardware virtualization	Supports
Floating-point and SIMD	Single/dual accuracy floating-point and ASIMD
Chip safety architecture	PSPA 1.0

Phytium X100 chipset

Device role	Micro processor matching graphics and I/O expansion chip
GPU compute rated	300 GFLOPS
Video de code	4K@30fps; H.264/H.265, MPEG4, MPEG2 etc.
GPU memory supports upper limit	Up to 8GB
Display control I/O	3 × DisplayPort1.4: including 2-ch up to 3840 × 2160@60Hz, additional 1-ch up to 1280 × 1024@60Hz
PCIe on	1×PCIe3.0 x16

05 COMPONENTS

Processor and device specifications (continued)

Phytium X100 chipset (continued)

PCIe downlink	Vendor list 8-ch downlink connect: 2-chx2 and 6-chx1; including 2-chx1 and SATA3.0 multiplexed
Expansion I/O category	PCIe3.0, SATA3.0, USB3.1, SD/eMMC, NAND Flash, I2S audio
Other on-chip I/O	2×SD/SDIO/eMMC、NAND、4×UART、96×GPIO、8×MIO、4×PWM、QSPI、2×SPI master、3×SMBus、2×CAN
Chip safety architecture	PSPA1.0

Sources: Phytium IT Co., Ltd., Phytium Tengrui D2000 high-performance desktop CPU; Phytium IT Co., Ltd., Phytium chipset X100.

06 APPLICATIONS

From product capability to applications

Industrial equipment controller

Module and with PCIe acquisition slot and serial I/O carrier combination, can handles acquisition task management, equipment parameters configured with and UI display. Soldered DDR4 up to 16GB, suited to per task and data cache requirement determine capacity; external equipment protocol de analysis and control cycle must be application software verification.

Rail equipment information processing

Dual DP and VGA resources can used for equipment information show, Gigabit Ethernet and industrial bus connect can service to field data aggregation solution. Project implement when needed according to actual environment selection processor position, cooling and carrier connect, and separately completes product can reliability and related industry requirements verification.

Can maintenance embedded terminal

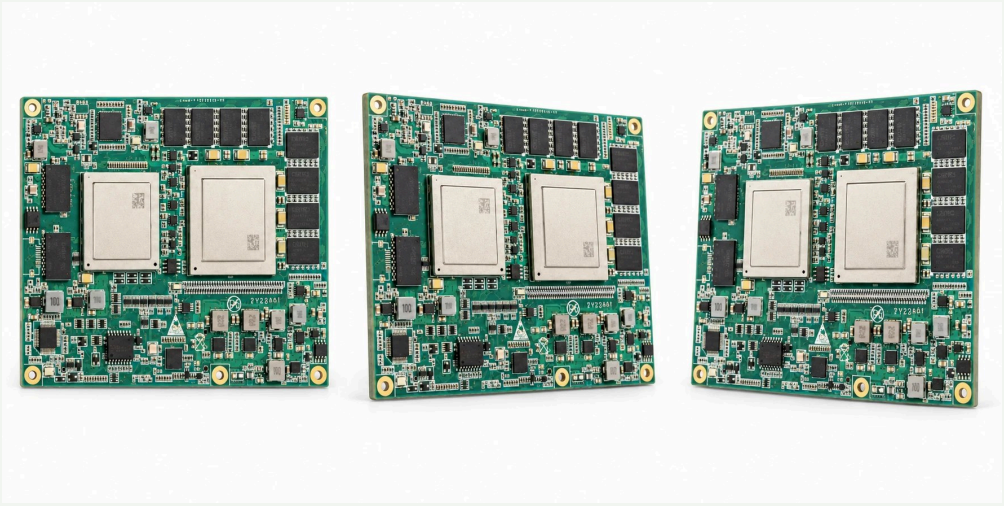
125 × 95mm module and application carrier forms can isolation compute unit, facilitates processing platform and terminal I/O design separate maintenance. System disk can around SATA or optional BGA SSD planning, equipment replace when retain match firmware, operating system, driver and carrier version log.

Integration checks

Platform position	Stated industrial grade 2.0GHz or commercial grade 2.3GHz solution; soldered DDR4 capacity upper limit 16GB, not default fully populated.
Channel multiplexed	2-ch CAN and 2-ch TTL per jumper select solution used; PCIe split relationship must per module pins table and firmware settings confirm.
Display limit	VGA per 1920 × 1080@60Hz, DP per 3840 × 2160@30Hz planning, do not apply X100 chip display upper limit.
Storage and temperature	BGA SSD120–512GB optional solution; check SATA installation, cooling and −40–65°Cproduct run conditions.

07 CONFIGURATION

Appearance, configuration and selection



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

Configuration

Provides industrial grade 2.0GHz and commercial grade 2.3GHz solution, module dimensions 125 × 95mm; BGA SSD optional 120–512GB.

Processor position	Industrial grade 2.0GHz / commercial grade 2.3GHz

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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