Compute Blade

RASPBERRY PI CM4 CARRIER BOARD

uptime
industries

Rack-mountable, PoE-powered carrier board for Raspberry Pi Compute Module 4 and compatible modules with all the necessary interfaces

The Compute Blade is a enterprise grade rack-mountable, PoE-powered carrier board for Raspberry Pi Compute Module 4 and compatible devices with all the necessary interfaces. With Compute Blade, you can create a high-density, low-power-consuming, plug-and-play blade server for home or data-center use.

Key Features

Raspberry Pi CM4 support + clones

NVMe SSD up to 22110 2230, 2242, 2260, 2280

Power over Ethernet IEEE 802.3at (PoE+)

Gigabit Ethernet

Raspberry Pi CM4 by PoE 5.1V power supply

WiFi, BT, and EEPROM write-protection

HDMI (up to 4k60)

USB-A, USB-C switchable USB input

TPM 2.0, secure boot (DEV, TPM Version only)

PWM fan connector

UART communication

UART0 on the front

nRPIBOOT

Uptime high speed module support

Controllable RGB LEDs

Compute Blade Platform Applications

Home labs

An enterprise-level homelab experience that you can use to build, play with, and explore new technologies

Hosting provider

Provide dedicated resources and isolate customer machines on a physical layer, to protect against modern CPU/hypervisor exploits.

Edge servers

Reduce latency and extend compute power to make your processes leaner, more efficient, and more cost-effective.

CI/CD systems and Automated tests

Perform performance tests on dedicated hardware for results far more stable than running tests on virtual machines.

Stateless Computing

Seamlessly deploy specialized stateless computing platforms, such as OpenFaaS, onto the blades to enhance functionality and performance.

High Availability Computing

Deploy robust, high-availability computing to maintain critical operations and services with minimal downtime.

Smart Homes

Make your home server highly available and increase the possibilities e.g by adding more modules like the Uptime AI-Module.

Private Cloud

Create your own secure, scalable private cloud for efficient data management and tailored IT services.

Education

Enhance educational experiences with practical, hands-on tech learning, facilitating innovation and computing skills.
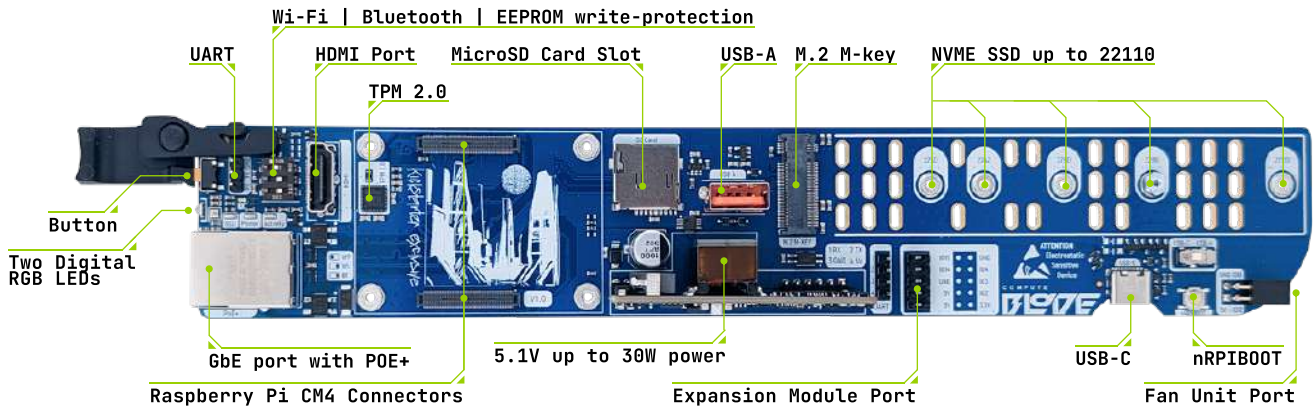
Scalable ARM Blade Server

Designed to work 24/7. Developed by listening and understanding the desires of real users. Fit up to 20 Compute Blades into a 1U rack space. Up to 80 ARM cores, 160GB RAM, and 10TB of NVMe flash storage in 1U 19-inch rack space.

Unlike conventional blade servers, our system eliminates a single point of failure as it doesn't rely on a server platform. While it still uses a PoE network switch (also necessary for blade servers), switches are simpler to replace or keep as spares compared to entire server platforms. Network equipment typically boasts high reliability.

Individual blades can be rebooted or power-cycled by momentarily disabling their switch port power. Thanks to the CM4's network boot feature, re-provisioning and system rescue are straightforward. Each blade is compact, devoid of moving parts, and can be easily shipped without special handling.

Specifications

Wi-Fi | Bluetooth | EEPROM write-protection

UART   HDMI Port   MicroSD Card Slot   USB-A   M.2 M-key   NVME SSD up to 22110

TPM 2.0

Button

Two Digital
RGB LEDs

GbE port with POE+   5.1V up to 30W power   USB-C   nRPIBOOT

Raspberry Pi CM4 Connectors   Expansion Module Port   Fan Unit Port

Compability	Raspberry Pi Compute Module 4 / 4 Lite
	Raspberry Pi Compute Module 4 Compatible Boards
Storage	M.2 NVMe up to 22110
	Micro SD
Networking	Gigabit Ethernet
	(Wi-Fi on some CM4 models, not recommended in rack usage)
GPIO	2 x UART
	7 x User Controllable GPIO including I2C
	Fan Unit Connector
	Programmable Button
	2 x Controllable RGB LEDs
Operating Voltage	5V - USB C
	5.1V - Power over Ethernet IEEE 802.3at (PoE+) up to 30W @5.1V
Input Power (Normal Operation)	2 - 8W
Ports	HDMI (4K60)
	USB A
	USB C
Security	TPM 2.0
	Hardware switchable Wi-Fi, Bluetooth and EEPROM write-protection
	Support for ZYMKEY 4i, Security Keys
Dimensions	42.5 x 250 x 17.5 mm

Versions

Compute Blade Basic

Mostly use for scaling your cluster environment. Contains only the necessary
components for a enterprise grade worker node.

Compute Blade TPM

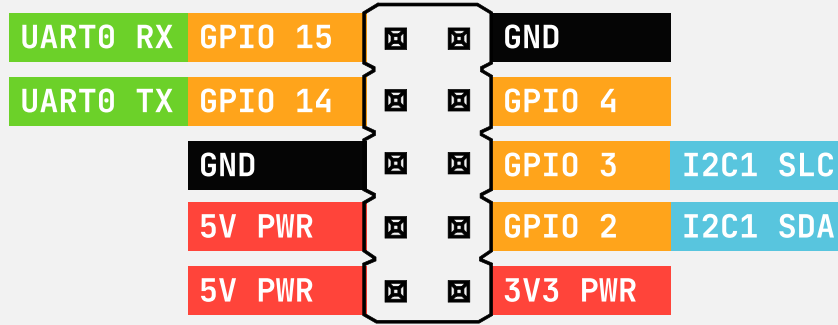Basic Blade + advanced security

Compute Blade Dev

Mostly used as master node and in development and homelab environments.

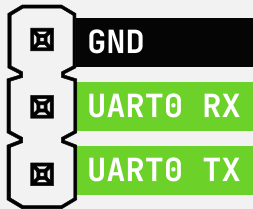|	Compute Blade Basic	Compute Blade TPM	Compute Blade Dev
Raspberry Pi CM4 port	✓	✓	✓
M.2 Key M up to 22110 for NVMe disks or high-speed modules	✓	✓	✓
1Gbit Ethernet with PoE up to 30W	✓	✓	✓
UART	✓	✓	✓
Compute Blade headers port	✓	✓	✓
Button	✓	✓	✓
Stealth mode	✓	✓	✓
Digital LEDs	✓	✓	✓
USB-A	✓	✓	✓
TPM 2.0 onboard	✗	✓	✓
HDMI port	✗	✗	✓
USB-C for bootloader update	✗	✗	✓
MicroSD card slot	✗	✗	✓
Wi-Fi, BT, nRPIBOOT	🔒 LOCKED	🔒 LOCKED	🔒⇄🔒 SWITCHABLE

GPIO

Expansion Module Port

This is the top part of the Raspberry Pi's GPIO connector. On the Compute Blade, PIN 1 corresponds to 3.3V, while on the Raspberry Pi's standard connector, it is labeled as 3.3V PWR.
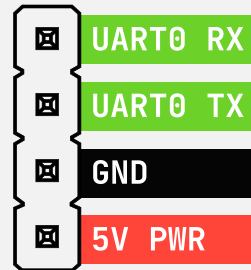
UART0 RX	GPIO 15	⊠	⊠	GND	
UART0 TX	GPIO 14	⊠	⊠	GPIO 4	
	GND	⊠	⊠	GPIO 3	I2C1 SLC
	5V PWR	⊠	⊠	GPIO 2	I2C1 SDA
	5V PWR	⊠	⊠	3V3 PWR	

⚠️ Short-circuiting the 3.3V and 5V supply will almost certainly destroy the CM4.

UART Front

⊠	GND
⊠	UART0 RX
⊠	UART0 TX

UART Back

⊠	UART0 RX
⊠	UART0 TX
⊠	GND
⊠	5V PWR

Fan Unit Port

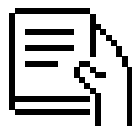| GND	○	○	GPIO 13	PWM1	UART5 RX
5V PWR	○	○	GPIO 12	PWM0	UART5 TX

Mechanical

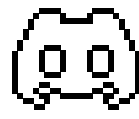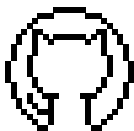17.2mm

250mm

24.5mm
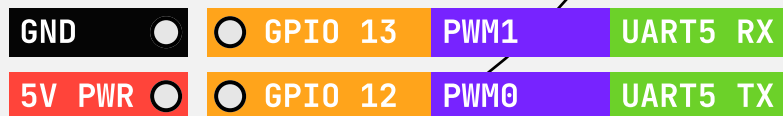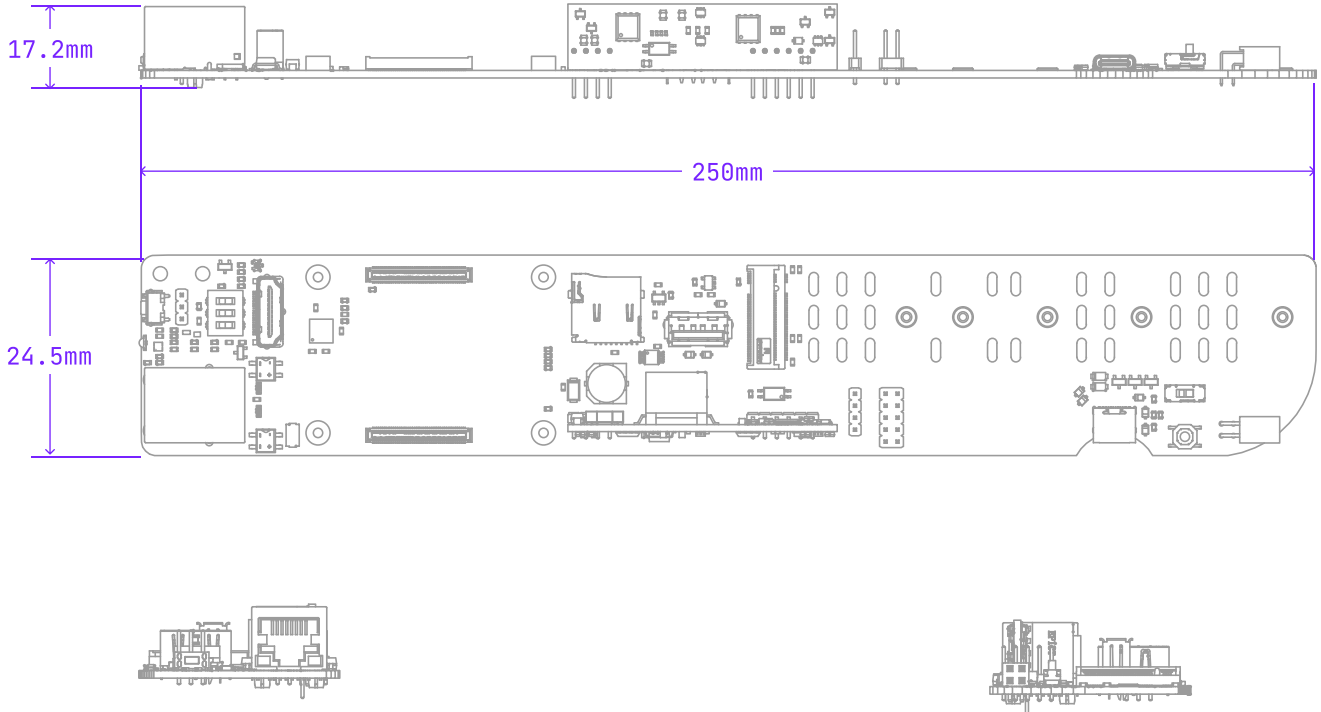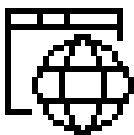
Documentation

DOCUMENTATION
docs.computeblade.com

GET STARTED
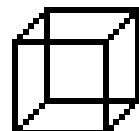docs.computeblade.com/getting-started

DISCORD
uplab.pro/discord

GITHUB
github.com/Uptime-Lab

DATA SHEETS
docs.computeblade.com/about

3D MODELS
docs.computeblade.com/models

For more information, visit

www.computeblade.com   www.uptime.industries   www.uptime.industries/legal