

Customer story

RevPi Connect 5 industrial computers

Powerful devices for IIoT and automation are even faster and more versatile with Raspberry Pi Compute Module 5

With the release of Raspberry Pi Compute Module 5, KUNBUS has extended its Revolution Pi series to include even faster and more flexible devices. With advanced interfacing and enhanced processing capabilities, RevPi Connect 5 is an ideal foundation for modern industrial edge computing applications.

Raspberry Pi solution	Raspberry Pi Compute Module 5 (CM5)
Size of business	SME
Industry	Industrial automation and IIoT

KUNBUS GmbH specialises in discrete communications components for industrial automation and IIoT systems. Its hardware platform Revolution Pi, a comprehensive modular and industrial-grade device series based on Raspberry Pi technology, launched in 2016 and has been successful ever since. These devices equip Raspberry Pi SBCs with custom software, enclosures, expansions, and peripherals, building reliable industrial performance on top of flexible and easy-to-use computers.

The release of Raspberry Pi Compute Module 5 towards the end of 2024 beckons in a newer, faster era of Revolution Pi. KUNBUS' new RevPi Connect 5 takes advantage of Compute Module 5's increased power and additional I/O interfaces, introducing advanced features that will take its performance beyond its predecessor RevPi Connect 4.

The Raspberry Pi Compute Module line has established itself as a future-proof platform



RevPi Connect 5 base module with maximum configuration of 10 expansion modules - I/O and gateway modules arranged symmetrically with 5 units on each side.

Compute Module 5's enhanced performance makes it an ideal foundation for industrial edge computing applications

The challenge

Since its launch in 2012, Raspberry Pi has established itself as the quintessential single-board computer. Thanks to its popularity, coupled with a massive community and an extensive collection of available software and scripts, Raspberry Pi has become a favoured tool for prototyping and proof-of-concept development across many industries.

However, as general-purpose computers, Raspberry Pi devices as sold do not possess all the features that challenging industrial environments require. They don't natively have sufficient electromagnetic compatibility protection or the ability to handle an industry-standard 24V power supply, and they are supplied without galvanic isolation of their interfaces. This represented an opportunity that motivated KUNBUS to develop the first Revolution Pi in 2016, addressing the need for an industrial-grade solution while maintaining the flexibility and openness of the Raspberry Pi ecosystem. The first-generation Revolution Pi was equipped with the original Raspberry Pi Compute Module, featuring a single-core processor and 500MB RAM.

The solution

The Revolution Pi series from KUNBUS represents a comprehensive industrial solution based on Raspberry Pi technology, serving various sectors since 2016. In early December 2024, the RevPi Connect 5, featuring Compute Module 5, will succeed the popular RevPi Connect 4. All devices in the series are built around Raspberry Pi Compute Modules, specially adapted to meet certain industrial requirements. Designed for versatility, the Revolution Pi serves multiple functions, including DIN rail-mounted industrial PCs, compact PLC, edge computing devices, and IIoT gateways.

The RevPi Connect 5 not only incorporates the new Compute Module 5, but also introduces advanced features including up to two CAN FD interfaces – a high-speed industrial communication protocol for real-time data transmission – and two Gigabit Ethernet ports, with the option to add two more via expansion module.



Compute Module 5's performance improvements make it an ideal foundation for modern industrial edge computing applications. Its enhanced processing capabilities efficiently handle demanding industrial tasks like real-time process control, data acquisition, and machine learning at the edge, while maintaining reliable 24/7 operation and cost-effectiveness. This makes the RevPi Connect 5 a compelling choice for industrial automation and IIoT solutions where computational power and reliability are crucial.

Beyond the Raspberry Pi-based modular base modules, Revolution Pi offers a wide range of digital and analogue I/O expansion modules, as well as fieldbus gateways supporting the most popular fieldbus protocols, such as PROFINET or EtherCAT.

On the software side, the devices run an industrially hardened version of Raspberry Pi OS, which has been modified, and is continuously maintained, by KUNBUS to meet industrial requirements. The modifications include, among many others, a real-time patch and a process image. Revolution Pi embraces true open-source principles across both software and hardware: all circuit diagrams, drivers, and the operating system based on Debian Linux are freely accessible and can be modified. This transparency allows users to fully understand and customise their systems. It enables companies to develop custom expansions and modifications, ensuring there's no vendor lock-in typical of traditional industrial automation systems.

To facilitate application development, Revolution Pi seamlessly supports industry-standard third-party software solutions like CODESYS for control applications. This compatibility enables users to implement sophisticated control tasks using familiar industrial programming environments, whilst taking advantage of

Revolution Pi's open architecture. The combination of established automation software with Revolution Pi's hardware creates a powerful and flexible platform for industrial automation tasks, bridging the gap between traditional PLC programming and modern IoT capabilities.

Why Raspberry Pi?

The choice of Raspberry Pi Compute Module as the foundation of KUNBUS' systems is based on clear arguments: the Raspberry Pi ecosystem is established worldwide and is already a familiar tool for many users. This familiarity enables customers to immediately begin working with Revolution Pi without complications.

Particularly in industrial applications, the guaranteed long-term availability of components is a crucial criterion. The Raspberry Pi Compute Module line has established itself as a reliable and future-proof platform, a decisive argument for many of KUNBUS' customers when selecting their product.

With each new Compute Module generation, the diversity of available variants has increased, which is reflected, amongst other things, in different RAM configurations and eMMC storage capacities. This steadily growing range of configuration options allows KUNBUS to provide increasingly specific and tailored solutions for its customers' requirements.

The unified kernel approach of Raspberry Pi OS offers significant advantages to KUNBUS and its users, both in its original form and in the company's own industrially

hardened version. Instead of maintaining different kernels for various Raspberry Pi models, a single kernel supports all hardware variants, ensuring consistent behavior across the entire platform. This streamlined approach simplifies software development and maintenance, as applications only need to be tested and validated once to work reliably across all supported devices. Updates and security patches can be deployed more efficiently, reducing potential compatibility issues and ensuring that all users receive timely improvements. KUNBUS maintains this unified kernel philosophy in its industrial version of Raspberry Pi OS, allowing the company to provide the same benefits while meeting additional industrial requirements.

Raspberry Pi OS ensures consistent behaviour across different devices, so software development and maintenance is simpler

The results

Developing a device with Compute Module 5 was the next logical step for KUNBUS. While the transition from Compute Module 3 to Compute Module 4 had already brought a significant performance boost, Compute Module 5 sets new standards: significantly enhanced CPU and GPU performance, along with innovative hardware features such as the integrated USB 3.2 controller and improved PCIe controller, enable KUNBUS to implement comprehensive improvements to its devices for its industrial customers.

With the introduction of CM5-based devices, KUNBUS is expanding its portfolio upwards. Customers can now choose a solution from a well-thought-out spectrum: from cost-effective, entry-level variants based on Compute Module 4S, through the mid-range with Compute Module 4, to high-performance devices featuring Compute Module 5. This diversity, together with KUNBUS' numerous I/O and gateway expansion modules, ensures there is an optimally equipped Revolution Pi device for every project.



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