



## Open innovation for the future of edge computing: How Antmicro accelerates the development of RISC-V-based and open-source hardware-software systems

Best practice category

New impetus for chip design, Partner collaboration and open ecosystems

Stakeholder group

SMEs and start-ups

Value chain position

Chip Design, Software, Open Source Silicon

## General Information

Antmicro is a software-oriented technology company with offices in **Sweden** and **Poland**, specialised in the development of edge computing systems for industrial sectors such as **robotics, defense, civil security, computer vision, broadcasting** and **Internet of Things**. With soft skills in software, full-stack FPGA SoC, edge-to-cloud AI and advanced hardware, and relying on its own open source tools like Renode, Antmicro supports customers in adopting cutting-edge technologies and developing customised solutions. The company is a founding strategic member of the RISC-V Foundation, Platinum Member of Zephyr Project and CHIPS Alliance, and collaborates with the open source community to promote interoperability and quality in IoT solutions.

## Activities and best practices

- To stay at the forefront of embedded systems the company carries out a significant part of its research and development activities in-house, collaborating with innovators and partners from all over the world in the field of advanced computing systems. One of the main examples of best practices is the use and continued development of Renode, the open source embedded system simulation framework created by Antmicro. Renode enables the modelling, testing and validation of **heterogeneous, multi-node** architectures, an approach that is particularly useful in high-complexity industries such as automotive, aerospace, defence and industrial IoT.
- Antmicro also implements a structured collaboration with industrial and research partners for the development of open technologies in the field of semiconductors and embedded systems. The company actively participates in numerous **European and international research projects**, including TRISTAN, aimed at creating tools and intellectual properties for the design of RISC-V-based SoCs intended for automotive environments, and VEDLIoT, that develops an IoT platform that uses deep learning algorithms distributed throughout the IoT continuum.

- In addition to research projects, Antmicro collaborates with a large network of leading semiconductor and technology companies, including **Infineon, Qualcomm, NXP Semiconductors, Bosch, Nordic Semiconductors, SiFive** and **Microchip**. These partnerships make it possible to integrate industrial and research experiences within an open ecosystem and to promote the dissemination of shared standards and platforms. For example, as a platinum member of the chip alliance that develops high-quality open source hardware designs relevant to silicon devices and FPGA designs, Antmicro has a leading role in the direction of the Alliance, a role it holds together with leading industry players such as **AMD, Intel, Microsoft** and **SiFive**.

## Challenges addressed with this practice

Antmicro addresses challenges in the semiconductor and embedded systems industry, related to the increasing complexity of edge devices and the need for open and interoperable standards. The adoption of open source tools like Renode allows for the simulation, testing, and validation of heterogeneous, multi-node architectures, reducing development time and costs and allowing companies to accelerate the design of RISC-V-based systems and integrated hardware-software solutions. Antmicro boasts a structured collaboration with industrial and academic partners, which facilitates the transfer of knowledge and specialist skills. This also stimulates shared innovation in the IoT, automotive, defence and high-complexity sectors. Furthermore, active involvement in European projects and open source alliances promotes the adoption of common standards and interoperable platforms. This collaborative approach helps the European semiconductor ecosystem and supports the development of more efficient solutions that are also sustainable and scalable at a continental level.