



## Axiomtek Chooses AMD Kria™ SOM for Fanless Edge AI Computer Vision System

The Kria K26 SOM accelerator enables the RSC201 to handle multiple algorithms on a single edge device and process multiple video streams or still images in real-time.

### PARTNER



### INDUSTRY

Industrial / Vision System

### CHALLENGES

Axiomtek was looking to build a new, low-latency computer vision system based on AI that could take automation to a new level.

### SOLUTION

Axiomtek chose the AMD Kria™ K26 SOM for its RSC201 Fanless Edge AI computer vision system. It can simultaneously handle multiple algorithms on a single edge computing device with ultra low latency.

### RESULTS

The AMD Kria K26 SOM accelerator delivers high performance with very low latency and simultaneous multiple algorithm processing in one edge device to meet the AI needs of Axiomtek's industrial edge customers.

### AMD TECHNOLOGY AT A GLANCE

AMD Kria™ SOM

Axiomtek is an industrial solutions company founded 34 years ago. The company is focused on automation, transportation, medical, retail, and gaming machines (slot machines). The Internet of Things (IoT) and artificial intelligence (AI) are taking automation to a new level, allowing more devices to be connected to one another, more machinery to be monitored, more insights to be discovered, and more efficiencies to be realized.

Axiomtek's line of products, which include industrial PCs, embedded systems, all-in-one touch panel PCs, DIN-rail embedded controllers, and IoT gateway devices, are feature-rich and designed to meet the challenging requirements for operation in the automation industry.

In 2018, Axiomtek started investing in AI. Many of its customers had standard controllers but wanted to add AI inference capabilities at the edge. The company started with GPU-based industrial computer vision systems but for applications that needed faster response times, the company decided to build an FPGA-based solution as well.

### CHALLENGE

Axiomtek wanted to make sure it chose the right solution to accelerate image and data processing on its RSC201 AI edge computer vision system.

There were many factors to consider, including cost, budget, expandability, and being able to simultaneously handle multiple algorithms — such as smart fence, vehicle plate recognition, pedestrian detection, and face recognition, — on a single edge device.

The solution to their problem was the AMD Kria™ K26 SOM (system on module) optimized for vision AI and robotics applications.

### SOLUTION

Fanless Edge AI computer vision systems, like Axiomtek's RSC201 vision system, can simultaneously handle multiple algorithms on a single edge computing device.

The Kria K26 SOM was not only able to handle multiple algorithms, but it did so with ultra-low latency. Within the Kria K26 SOM, the Zynq™ UltraScale+™ MPSoC from AMD, capable of reducing power consumption by eliminating static power of unused blocks using its flexible architecture, enabled Axiomtek to come up with a fanless design of the RSC201 for heat dissipation via natural convection to minimize operating costs, and maintain a steady operation at a low failure rate.

The Zynq™ UltraScale+™ MPSoC also enabled the RSC201 to process multiple video streams or still images in real-time, which in turn, enabled fisheye calibration, perspective transform, and

image enhancement for up to 8 video inputs supporting up to 2048 x 2048 input and output resolutions.

Finally, the system was designed to operate in a wide range of temperatures going from -30°C to 70°C, thanks to its natural convection cooling system.

After Axiomtek took the RSC201 to market, customers were very impressed with the performance of the AMD adaptive computing platform, so Axiomtek arranged a demo in London of a dice recognition gaming application for casinos. The results were impressive. The system was able to track the position of the dice on the table and provide a readout immediately.

Another application for the RSC201 is to enable Advanced Driver Assist Systems (ADAS) and security features in an electronic bus. One of its customers installed 11 cameras on a bus and chose the RSC201 for AI inferencing because of the AMD adaptive computing processor inside. "The technology is very good at preprocessing and adjusting images that are not easily read by the reader," said Axiomtek manager, Ken Pan.

"The video streams are displayed on a panel next to the driver, who can get a real-time view of his surroundings to enhance the security and safety of the bus," Ken Pan said.

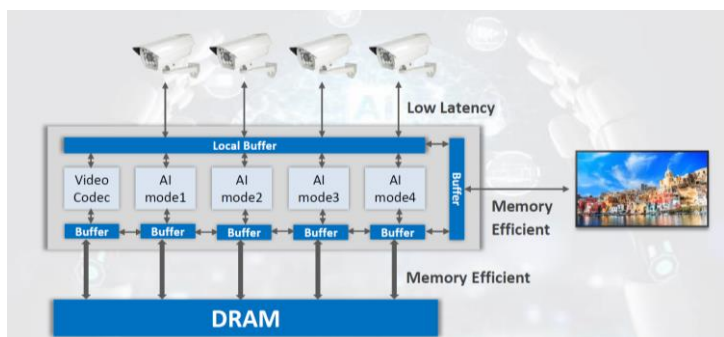


Figure 1 - AMD Kria SOMs are used inside Axiomtek's industrial computer vision solutions.

## RESULT

"The Kria K26 SOM delivers high performance with very low latency and the ability to simultaneously process multiple algorithms in one edge device," Ken Pan said. The advantage comes from the fact that the image sensor output is passed directly to the image processing engine in the Zynq™ UltraScale+™ MPSoC without a need to extract the data from external DDR memory. "This delivers a substantial increase in throughput at low latency compared to other platforms," Ken Pan said.

Ken Pan said another key advantage of the Kria K26 SOM is that it can support multiple inference tasks at the same time, remaining very stable under heavy loads. It can also reliably operate under a broader temperature range than competing solutions from -30 degrees C to 70 degrees C. This makes the solution particularly useful for applications in extreme temperature environments.

"It's been a great experience cooperating with AMD and Anstek on this project," Ken Pan said. "Whenever we've had technical issues, both AMD Taiwan and Anstek have been incredibly responsive."

### WANT TO LEARN MORE?

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About [Axiomtek](#)

#### About Axiomtek

Axiomtek has experienced extraordinary growth in the past 30 years because of its people, years of learning, and desire to deliver well-rounded, easy-to-integrate solutions. These factors have influenced the company to invest in a growing team of software-, hardware-, firmware-, and application engineers. For the next few decades, Axiomtek's success will be determined by its ability to lead with unique technologies for AIoT and to serve key markets with innovative solutions--packages of hardware and software coupled with unmatched engineering and value-added services that can help reduce the challenges faced by systems integrators, OEM and ODM customers, and prospects alike. Axiomtek will continue to enlist more technology partners and increase collaboration with its growing ecosystem of partners who are leaders in their fields. With such alliances, the company plans to create synergy and better deliver solutions, value, and expertise its customers need. For more information about Axiomtek, visit the Axiomtek website, LinkedIn, and YouTube pages.

<https://www.axiomtek.com/>

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#### About AMD

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