
EVO II
RENDER ENGINE
ZERO DENSITY
We are Imagining Next.
This is EVO II.

INTRODUCTION

Creating the EVO II render engine was a process of intense research, component selection, testing, benchmarking, and setting up innovative production methods.

We literally sweated the detail of every single component to create the most powerful high-end broadcast -game based - render engine on the market. We are immensely proud to present to you our new flagship product.

We are Imagining Next.
This is EVO II.

Kuban Altan

Co-founder & CTO

Ultimate performance crafted for real-time virtual production.

EVO II
RENDER ENGINE

Ultimate performance crafted for real-time virtual production.

Exceptional virtual productions demand exceptional hardware to deliver the rendering power and ultimate performance you need for high-end virtual production environments.

Where high-end servers lack the specialised specifications of gaming hardware, gaming systems don't come equipped with essential professional 24x7 operational features such as redundant power supplies and rackmount capabilities. Until now, no engine on the market was capable of delivering everything in one package.

So we made our own, re-engineered the concept of rendering hardware that supports game engine-based virtual productions, and unleashing the full potential of our Reality5 virtual production platform.

From PCBs to power cabling and cooling, we meticulously reviewed every component, and developed better alternatives in-house when industry standard components fell short.

The resultant EVO II render engine is the most advanced real-time virtual production render hardware platform on the market today.

Designed for endurance. Crafted for ultimate performance. Purpose-built for one task: game engine-based, real-time rendering, compositing and video input/output for virtual production.

The best hardware.
The best platform.
The best results.

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Bring your creative vision to life without compromise. EVO II render engine running the Reality5 virtual production platform is the best possible combination of hardware and software for real-time rendering, compositing and video input/output for virtual productions.

Visual impact.

Our eight-year expertise using gaming engines to create hyper-realistic virtual environments and dynamic data-driven graphics has led us to create this high performance virtual production hardware platform that gives you the power to always render and composite at the highest possible quality in real-time.

Best in class performance.

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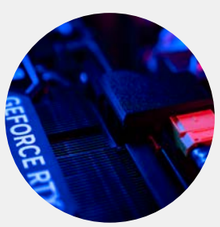
BEST IN CLASS PERFORMANCE

EVO II's astonishing performance is driven by four core factors:
the GPU, the CPU, the power delivery system, and thermal management. The successful combination of these four elements determines the overall performance of the render engine, and makes it possible to unleash the full potential of our new Reality5 platform.

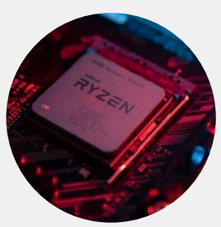
We carefully selected the best components for the EVO II render engine after meticulously reviewing every possible alternative. If we couldn't find a component that met our needs, we developed our own to the right specifications.

CORE FACTOR 1



The GPU

CORE FACTOR 2



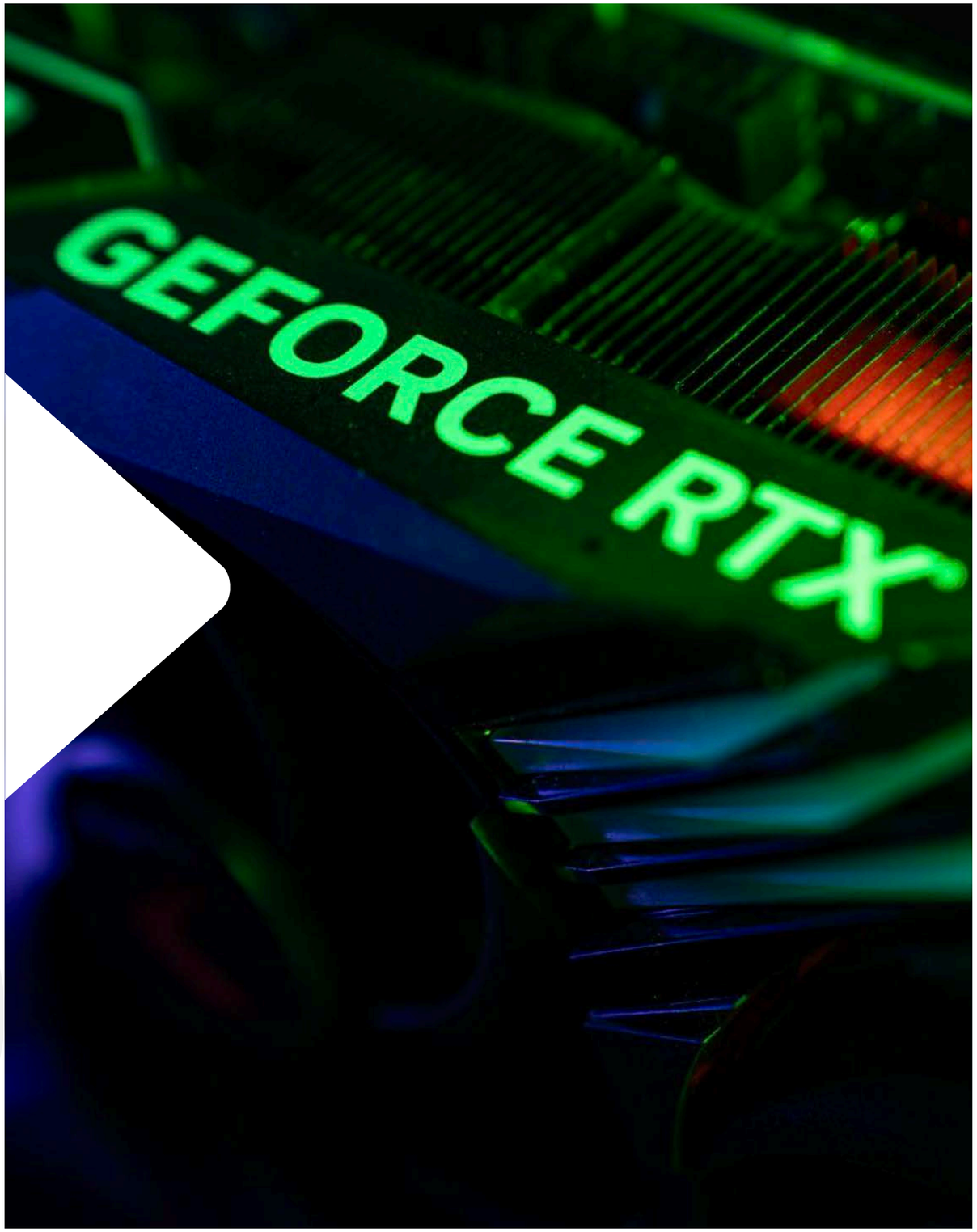
The CPU

CORE FACTOR 3

The Power Delivery System

CORE FACTOR 4

The Thermal Management



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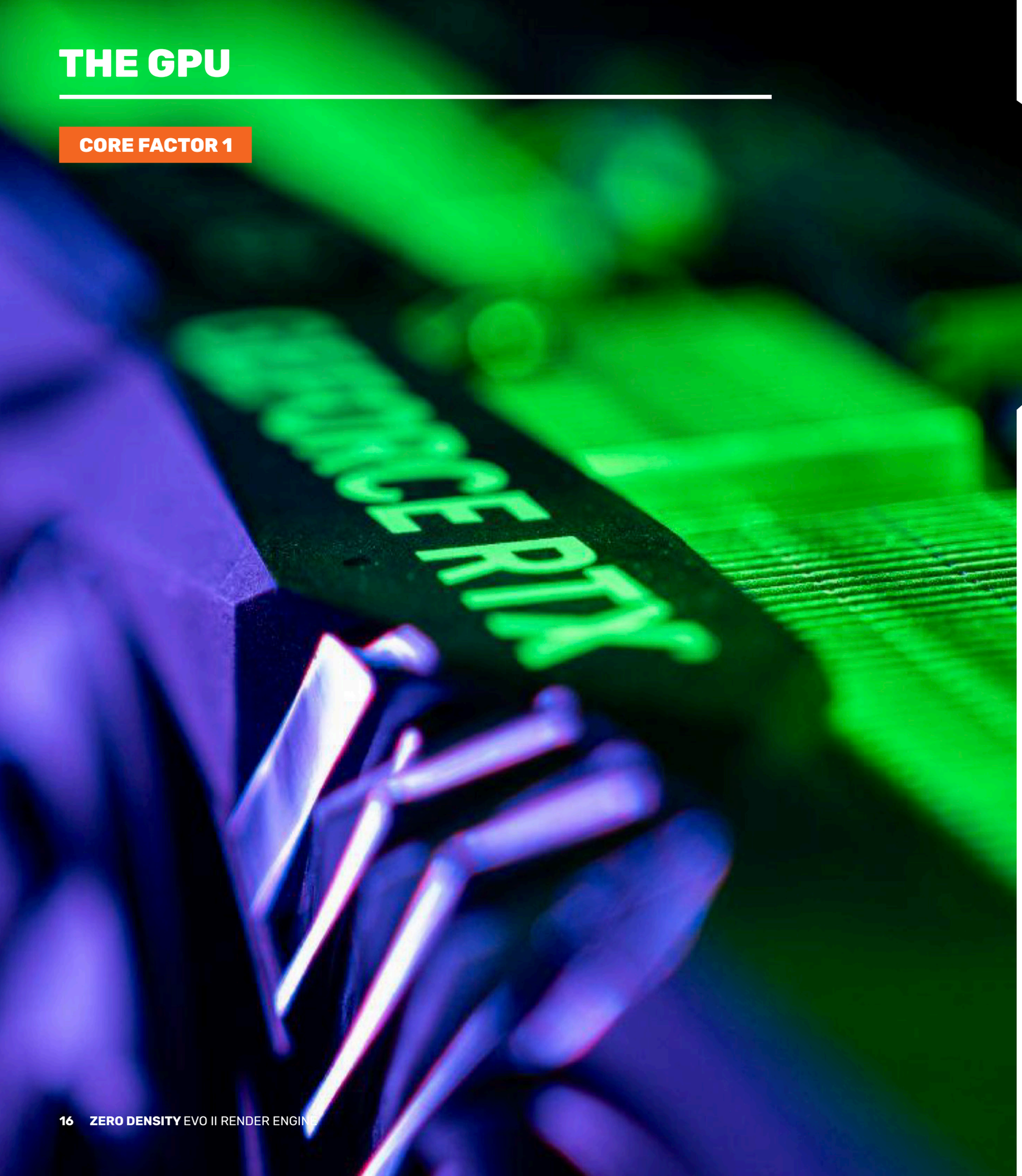


Ultimate rendering power and efficiency.

Our new Reality5 architecture brings the capabilities of GeForce GPU cards to the broadcast industry. Tailor made for demanding, game engine-driven virtual productions, the GeForce RTX 4090 significantly boosts both the efficiency and quality of the rendering processes. In studio tests the new Reality5 architecture managing the RTX 4090 achieved an impressive 99% GPU utilisation, delivering unparalleled render performance with Unreal and NODOS render threads.

Thanks to meticulous attention to detail during the engineering process, there's no need to overclock the GPU. Working within the operating limits of the GPU makes the EVO II render engine far more reliable in the long term, ensuring that the GeForce RTX 4090 meets the game requirements of broadcast environments.

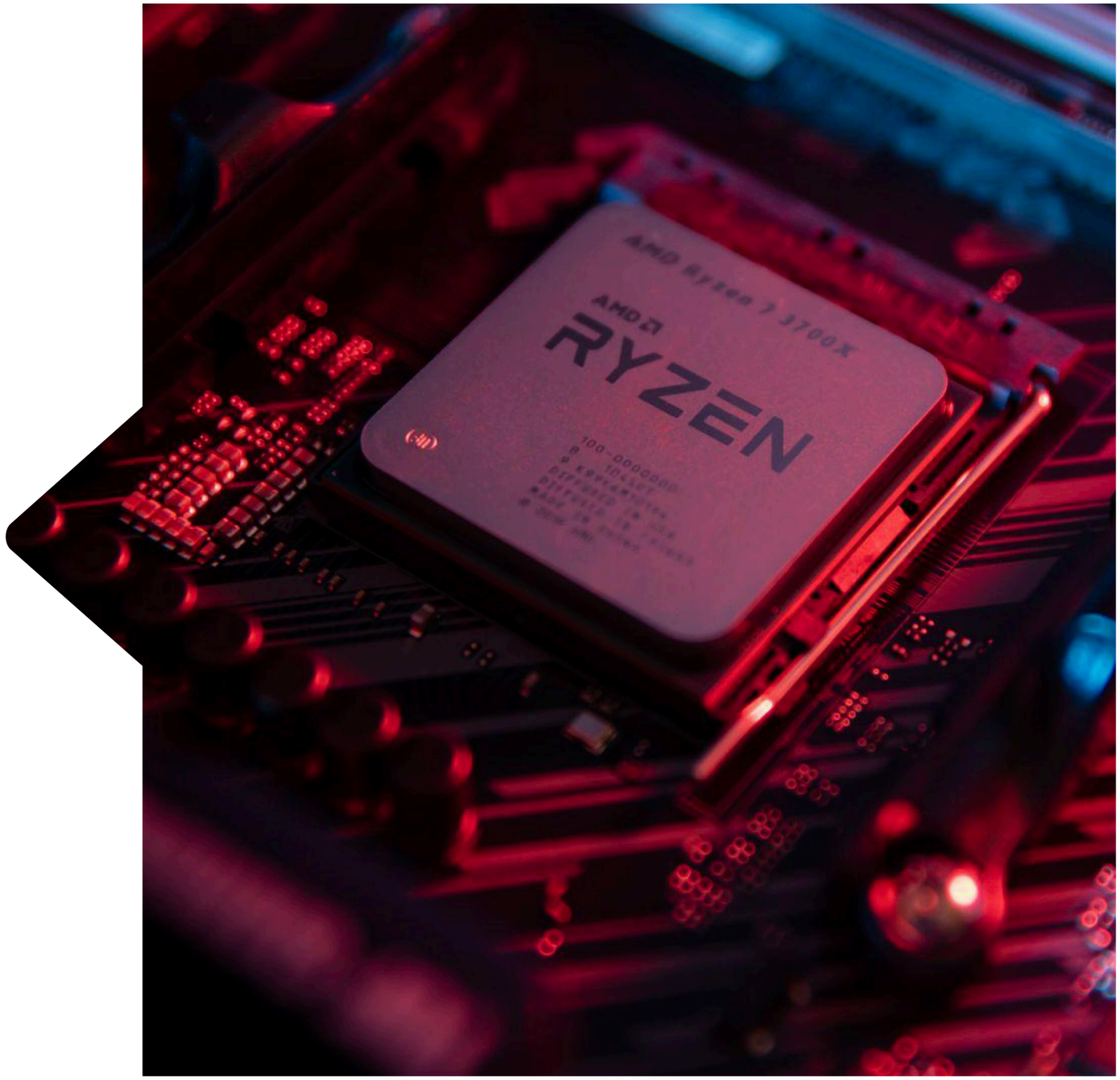
Compared to Quadro 6000 ADA cards, the new ADA generation GeForce GPU cards offer superior rendering performance with game engines. With half the VRAM (24GB), fewer Tensor and RT cores, higher power capacity (450 Watts) and advanced heat management capabilities, the RTX 4090 delivers 32% higher game engine rendering performance*.

* In the furmark (GL) GPU benchmark test. See full results on the benchmark test page.

CORE FACTOR 2

Unparalled CPU perfomance.

The AMD Ryzen 9 7950X3D Central Processing Unit delivers unparalleled single-thread performance and comparatively lower power consumption and thermal characteristics. Its 16 cores and 32 threads also support other demands of the Zero Density Reality5 platform.



POWER DELIVERY SYSTEM

CORE FACTOR 3

Perfectly delivered power.

The fully redundant, hot swappable, 900 Watt power supply, for which we designed an entirely new DC power distribution platform, uses components specifically chosen for their ability to efficiently distribute low voltage at high currents. It ensures that each component receives the right amount of power without voltage drops.

THERMAL MANAGEMENT

CORE FACTOR 4

Thermal management is a priority in high-performance rendering. Keeping the CPU and GPU cool maintains their performance and long-term integrity. EVO II is equipped with two large, variable speed fans at the front of the chassis.

The rigid, lightweight rack-mountable chassis incorporates more effective 4U redundant air intakes with fans located over the full height of the chassis to help maintain optimal internal temperatures.

A single board computer monitors external temperature and humidity, and the internal operating temperature of the render engine, and adjusts the fans' speed as necessary.

We also streamlined the internal layout, redesigning the cable volume inside the chassis to maximise airflow and ensure that the CPU and GPU are efficiently cooled.

To maintain optimal air intake, the fan cover is easy to remove and clean, even while the machine is running. The fan itself can be temporarily stopped to ensure safe maintenance without disrupting operation.

The cooling of the EVO II is so effective that the temperature of the GPU does not exceed 80 degrees under full load. In other systems you would expect to hear the fans howling at full speed, but the quiet fans in the EVO II render engine emit less than 50 dBA under full load*.

* In the furmark (GL) GPU benchmark test. See full results on the benchmark test page.

Built for security and reliability.

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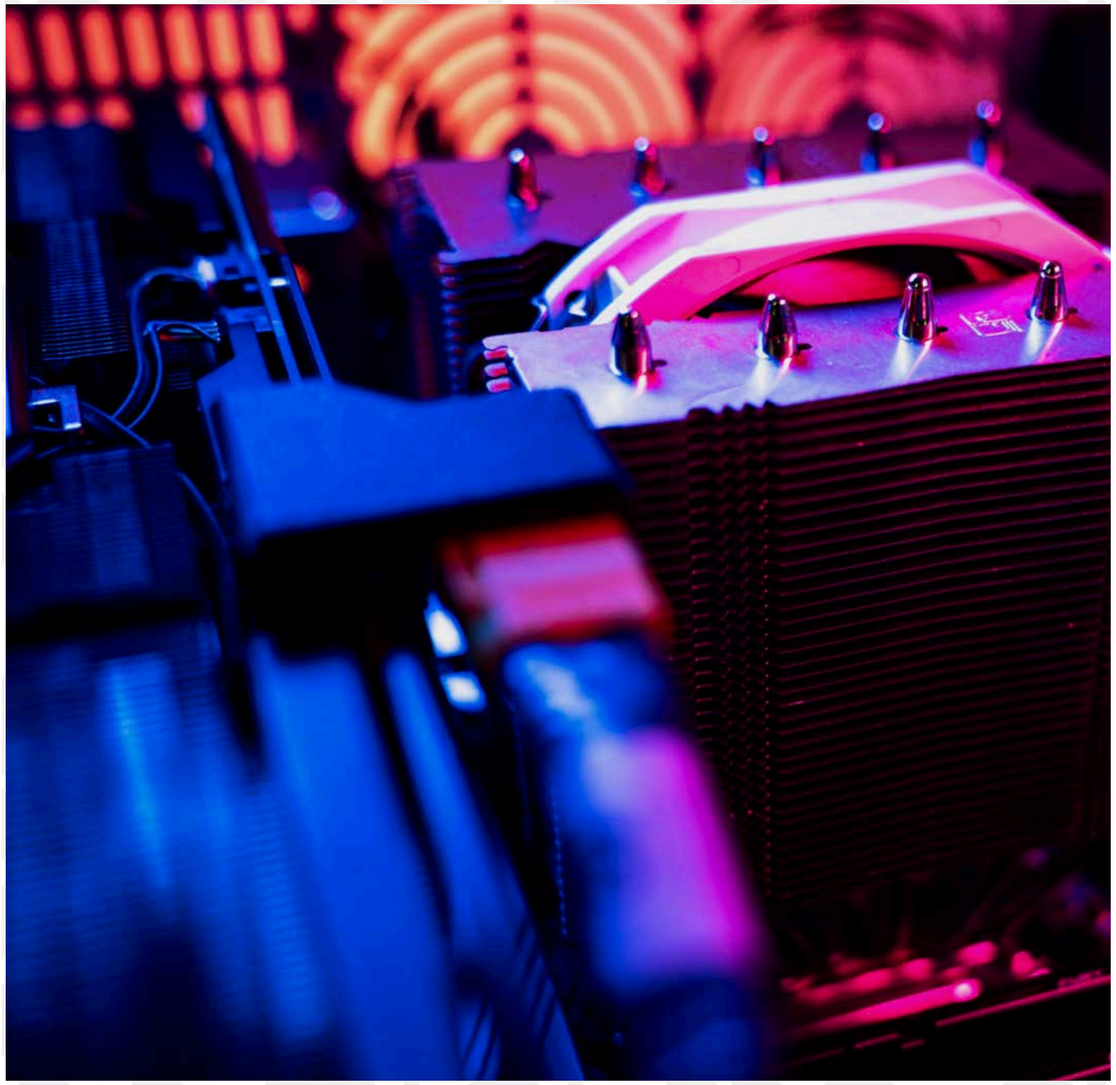

Built for security and reliability.

We designed every aspect of the EVO II render engine to meet the specific high performance, security and reliability demands of virtual production environments.

The EVO II uses M2 SSDs over traditional SATA connections, leveraging the mini PCI bus to achieve the lowest latency possible.

Numerous components within the EVO II chassis are precisely fabricated using high-end 3D printing technology, which allows us to create custom parts in low volumes while maintaining high quality and durability standards. To adhere to the highest fire safety requirements, components exposed to significant electrical loads are printed using fire retardant materials.

To prevent accidental disruptions and security breaches, we've removed front USB ports and wireless communication hardware.

Finally, to complement the optimised hardware, we created a custom distribution of Windows 11 to ensure that all drivers and OS components support the performance of the EVO II render engine.

Monitoring, Control and Maintenance.

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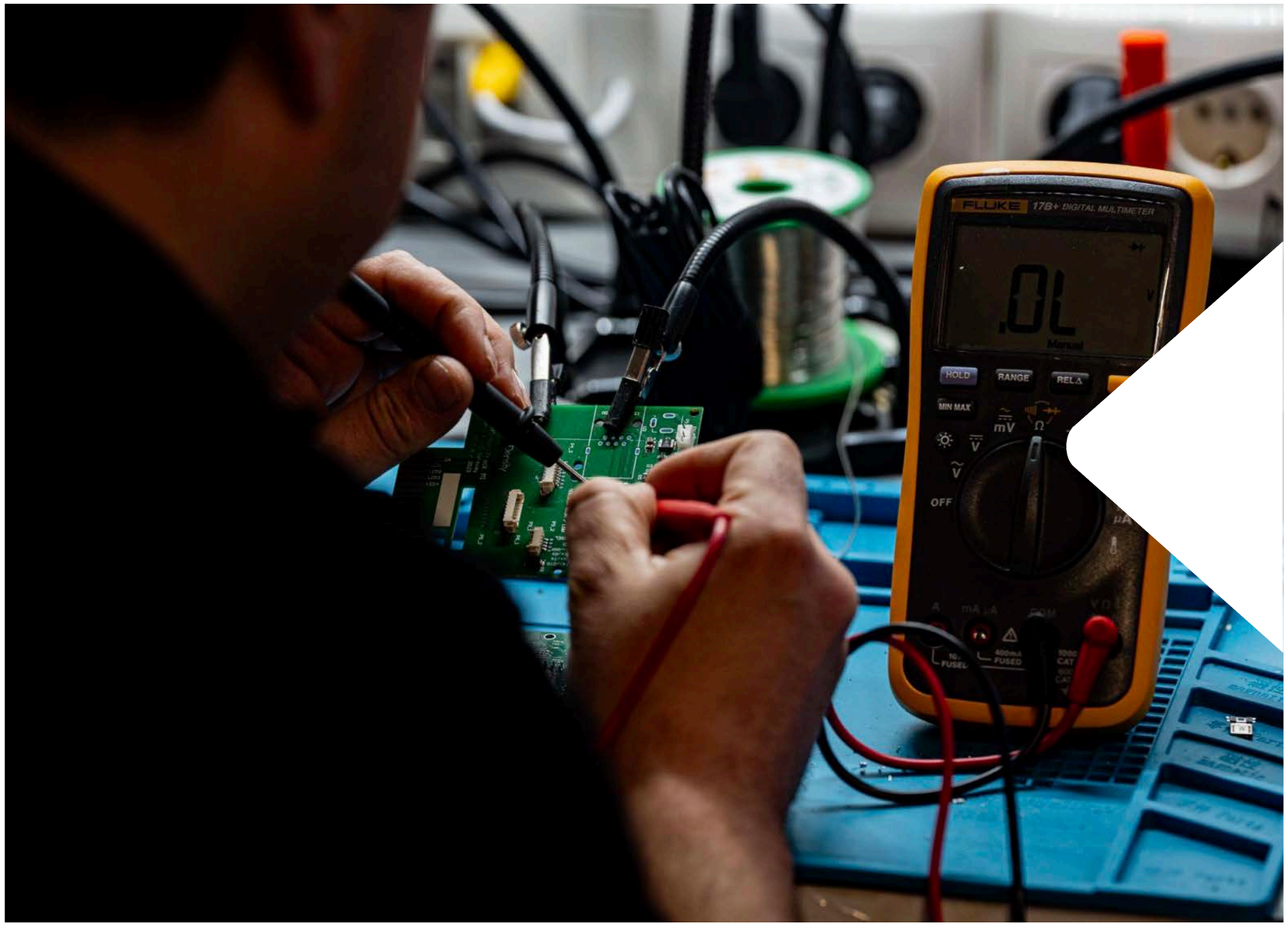
COMPREHENSIVE OVERSIGHT

For comprehensive oversight of the machine's physical and operational status, a single board computer monitors temperature and CPU/GPU data, ambient temperature and humidity, cooling fan speed, and the status of the redundant power supply. It also detects any motion of the chassis.

You can access all this data via the Reality Hub hardware monitoring system, and the touchscreen display on the front of the EVO II chassis. The touchscreen shows you the system status and provides access to configuration information. Thanks to a bidirectional connection with Reality Hub the RGB status indicators in the fans report not only the status of the hardware, but also the status of Reality5, if, for example, the shaders are being compiled the fans turn to a specific color.



Quality Assurance and Quality Control.

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QUALITY ASSURANCE AND CONTROL

Our rigorous Quality Control process makes sure that every EVO II we produce meets the benchmarks we set during the initial component selection and architecture build phase.

Every component is tested before, during and after modification and assembly. They are inspected and tested under full load conditions to verify that they perform to the standard set by the quality assurance specifications. This meticulous component selection and testing process ensures the reliability and performance of the final product.

BENCHMARK

	EVO 1 QUADRO 6000	EVO II QUADRO 6000 ADA	EVO II GEFORCE RTX 4090
GPU	AMPERE	AD102	AD102
VRAM	48GB	48GB	24GB
CUDA Cores	10.752	18.176	16.384
Tensor Cores	336	568	512
RT Cores	84	142	128
FPS (higher is better)	176 (15 min average)	346 (15 min average)	457 (15 min average)
GPU Temperature	86C / 187F	85C / 185F	78C / 172F
GPU utilization	99%	97%	95%
GPU Power usage	297 Watts	298 Watts	442 Watts

SPECIFICATIONS

EVO II render engine for:

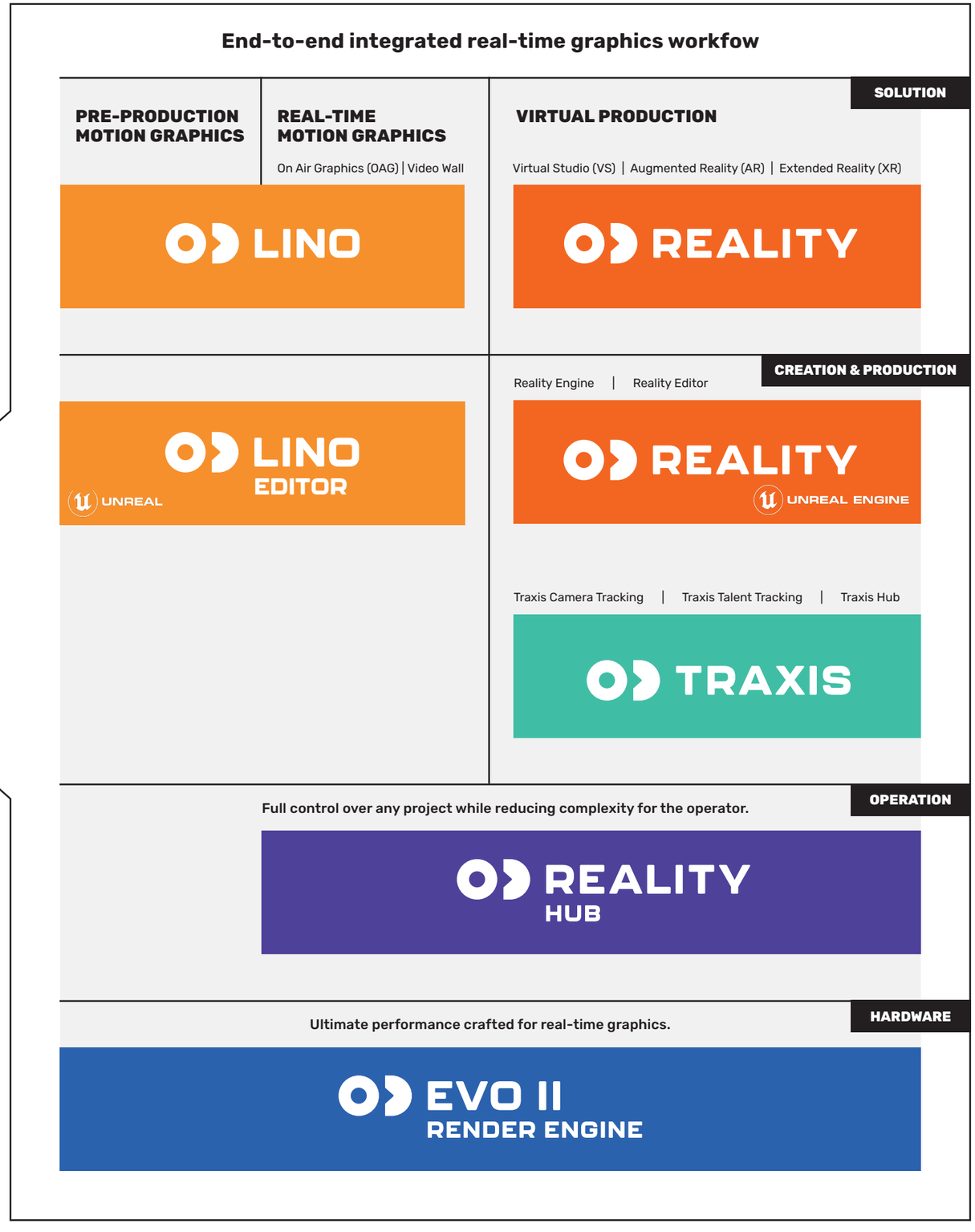
REALITY

CPU	AMD Ryzen 9 7950X3D
RAM	DDR5-5200 64 GB (32x2)
Harddrive	1 TB M2 SSD
GPU	NVIDIA RTX 4090
ID Card	AJA 12G 44
Ethernet	1x 10 GbE & 1x 2.5 Gb2E
PSU	900 Watt redundant, hot swappable, power supply
OS	Windows 10 Pro
RACKMOUNT	19” Rackmount rail kit

CE EMC

INTEGRATED WORKFLOW

Our EVO II hardware platform plus Reality5 virtual production platform integrate seamlessly into any broadcast environment workflow. You can enhance your storytelling with dynamic visuals and data-driven graphics, while also lowering total cost of ownership, and boosting operational efficiency.



About Zero Density

Zero Density gives visual storytellers the tools they need to bring their creative vision to life, effortlessly and with lasting impact. Our integrated virtual production and real-time motion graphics platforms boost operational efficiency and deliver results you can rely on. Zero Density is your forward-thinking industry partner, with offices around the globe serving clients such as The Weather Channel, Viaplay, Sky News Arabia, FOX Sports and Warner Media.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