

Sulon Q™ Headset

GDC Sneak Peek

FAQ

Who is Sulon and what do you do?

Sulon is a start-up based in Toronto, Canada. We're working hard to make exploring virtual worlds as simple and intuitive as exploring the real one, and towards that goal, we've designed the Sulon Q™, the first and only all-in-one, tether-free, "wear and play" headset for VR, AR and spatial computing that seamlessly maps the real world so that people can fully enjoy and interact with the virtual one.

What are you announcing today?

Today we're showing a sneak peek of the Sulon's forthcoming headset: the Sulon Q™, the world's first and only all-in-one, tether-free, "wear and play" headset for virtual reality, augmented reality, and spatial computing.

What are the features of the Sulon Q™ headset?

We're happy to provide you with a spec sheet that goes into more detail, but the biggest features of the Sulon Q™ headset are:

- **Distinct "Wear and Play" design** – The Sulon Q™ headset lets you take every world anywhere thanks to its simple and intuitive all-in-one, tether-free, "wear and play" design. There are no confusing minimum specs to be concerned with. No tangled wires to hold you back. No external tracking systems for movement or gestures. Everything you need is in the lightweight, comfortable, and ergonomically designed Sulon Q™ headset. Just put it on and go.
- **VR and AR: The best of both worlds** – Enjoy the best of virtual and augmented reality using Sulon's advanced Spatial Processing Unit which combines revolutionary, real-time machine vision technologies enabling you to effortlessly enhance the real world through augmented reality applications, and seamlessly transition from the real world to virtual worlds. The Spatial Processing Unit is a innovative mixed reality spatial computer that provides real-time environment mapping and tracking from the inside outward, dynamic virtualization for VR/AR fusion, and gesture recognition.
- **Spatial computing with Microsoft Windows® 10** – Enjoy holographic computing interfaces once reserved for science fiction by placing applications in space in your own living room with a large, immersive 110-degree field-of-view. Multi-task like a professional putting transparent or opaque windows where you want using gestures or the wireless keyboard and mouse provided in the box, or any other Windows 10-compatible controllers and joysticks.
- **Spatial redirection for endless virtual walks, even in your living room** – With some smart perceptual tricks, Sulon's real-time spatial technologies let you walk around and explore virtual environments that are seemingly larger than the physical space you're in. Enjoy a fully interactive VR experience in any space, letting you be a true participant in the virtual world, not just an observer from a single viewpoint or confined to moving using gamepads and controllers.
- **Console-quality graphics and powerful processing** – The Sulon Q™ headset harnesses the latest in processor technology using the recently launched AMD FX-8800P processor at up to 35W with Radeon™ R7 Graphics leveraging AMD's Graphics Core Next architecture. The full performance of 4 compute cores and 8 GPU cores are unlocked through a revolutionary Heterogeneous System Architecture (HSA), enabling the cores to share memory to work together for dramatic performance and efficiency. The result is a solution that is optimized for modern workloads and media formats, capable of driving the latest graphics APIs including DirectX® 12

and Vulkan™, and able to render stunning videogame console-quality visuals on a beautiful 2560x1440 OLED display. The Sulon Q™ headset also integrates AMD's LiquidVR technologies to help ensure smooth and responsive VR and AR experiences.

- **Incredible spatial audio** – Powered by GenAudio's AstoundSound® technology, used by the top game and entertainment studios in the world, the Sulon Q™ headset's 3D spatial audio lets you hear sounds within a complete spherical soundscape with advanced room simulation techniques that provide distance cues using the headset's 3.5mm audio jack in combination with custom spatially-optimized Sulon Q earbuds. For voice communication, the headset also includes dual noise-cancelling embedded microphones.

Who are you targeting with the Sulon Q™ headset?

We think there are tremendous use-cases for both consumers and businesses. On the consumer side, we can envision what you might call a “prosumer” or power user, wanting to set up his or her dream computing environment in AR using our spatial computing technologies. Gaming is obviously a big area and we think our HMD offers some incredibly compelling ways to game where you go from an AR environment in your living room to a completely virtual environment of the game. On the business side, the capabilities of the headset really open the door for applications that haven't been tried before. For example, a developer could design a home that could be placed on a real-world lot using AR, you could walk into that house and be in a completely virtual environment, and then look out the window of that house back into the real world using AR again. We're excited to see what developers and businesses think of.

What is the performance of the Sulon Q™ headset?

The Sulon Q™ headset harnesses the latest in graphics processor technology using an AMD FX-8800P processor at 35W with Radeon™ R7 Graphics to deliver stunning console-quality visuals. We expect to see 2560x1440 at 90Hz offering a 110-degree field-of-view on the beautiful OLED display.

HMD delivers a very different and unique experience compared to any other solution based on the combination of it being an all-in-one form factor with real-time spatial mapping so it's not an apples to apples comparison.

What applications are available for the Sulon Q™ headset?

For our sneak peek we're only showing off a couple of applications: a mixed reality demo called Magic Beans and an example of design in a virtual environment where you can explode an engine, look at the parts, and then put it back together. Of course we'll have more applications to talk about at launch.

Does the Sulon Q™ headset come with Windows 10 pre-installed?

Yes.

Do all Windows 10 applications work on the Sulon Q™ headset? How is the usability of apps that are typically meant for the screen?

Yes, all Windows 10 applications work on the Sulon Q™ headset. The apps work just as they would on a typical 2D display except they're in 3D space so you can put them anywhere you want. We like to call it Digital Decorating.

What is the launch date of the Sulon Q™ headset?

We expect to launch late spring.

How much will the Sulon Q™ headset cost?

We'll reveal pricing for the Sulon Q™ headset closer to launch.

What is the Spatial Processing Unit? What does it do?

The Sulong Spatial Processing Unit is a set of technologies that includes:

- Proprietary environment mapping and tracking developed by Sulong
- Developer access to real-time, synchronized vision system with highly tuned cameras
- Developer access to camera images directly from high speed memory taking advantage of the APU HSA memory
- A high-definition, beautifully enhanced Augmented Reality imaging system for seamless visual AR and VR experiences
- Developer access to high-speed robust camera pose tracking which uses the environment to map and track oneself
- Inside-out mapping and tracking of the user with minimal setup, and environment-based inside-out tracking
- Dynamic, real-time virtualization which dynamically reconstructs and displays a virtual version of the real world to the user and to applications. This allows us to do anything to the real world that computational physics and rendering enhancements allows. Our goal is to beautify and accessorize the environment where it can seamlessly blend the real world and virtual content together. For example:
 - We can change the lighting of the real environment by adding our own lights. Imagine adding a fireplace into your living room, where it actually provides illumination propagating from the virtual fireplace to the virtualized world.
 - If had a virtual soccer ball, and you kicked it, the ball will bounce off of items in your environment and even break or shatter real objects represented by virtual versions.
 - Imagine when you look at yourself, you are wearing new clothing that is virtual.
- A robust and continually improving gesture library. The “Project Dragon” application supports this feature along with other features of Windows 10 such as Cortana and DirectX 12. Gestures help us to seamlessly interact with virtual objects more intuitively thus enhancing the human experience further.

Our Spatial Processing Unit (SPU) has been built with developer scalability and future applications in mind to ensure not just amazing spatial computing experiences today, but also encourage developer experimentation to help develop significant advances in computer vision, AR and VR tomorrow. The Sulong Q™ headset is a consumption platform, but also a developer platform as well. We want people to create using it.

The SPU receives information from the inertial measurement unit (IMU) which includes an accelerometer, gyroscope, and magnetometer and combines this with revolutionary computer vision and machine vision advancements that follow the user and their environment to augment the user’s visual perspective with virtual content to help make for a more immersive experience.

Do you have an SDK?

Yes, we’re launching our SDK shortly. It will be available on our website at Sulong.com. The SDK will provide details for development for the Sulong Q™ headset, technical documentation, samples, and open source demos with instructional videos.

What features of AMD’s LiquidVR are you using and how do they benefit the experience?

We’re making use of several of AMD’s LiquidVR technologies and plan to use more of them in the future. Today we’re using “Direct to Display”, which reduces latency and gives us full control over how we draw our immersive interface. We’re also using “Asynchronous compute” which allows to more easily schedule critical actions such as distortion correction and avoid dropped frames by allowing us to present new views of previous frames when an actual new frame isn’t ready. In the future we expect to

use the full suite of LiquidVR technologies to continually advance the science of both AR and VR, and of the Sulon Q™ headset.