

A new generation of stereoscopic high-resolution virtual reality

AMD FirePro™ Professional Graphics and Schneider Digital:
helping the Center for Energy Research to interpret oil and
gas field geology.





AMD Firepro™ & Schneider Digital Case Study

The Mini VR Wall - a new generation virtual reality display system

Visualisation of hydrocarbon reservoir structures generated from oil and gas field surveys is a complex and difficult task. Organisations involved in such work are increasingly turning to a new generation of high-technology solutions to help them in this task. One such organisation is run by Prof. Dr. Leonhard Ganzer at the Energie-Forschungszentrum Niedersachsen (Center for Energy Research). To help research teams to visualise and therefore interpret such models, Professor Ganzer now relies on the Mini VR Wall virtual reality (VR) display system provided by Schneider Digital using AMD FirePro™ Professional Graphics Cards and AMD FirePro™ S400 Synchronization Modules. Now, with the launch of the 4GB AMD FirePro™ V9800 professional graphics card, the Mini VR Wall can achieve even greater levels of performance and cost-effectiveness.

Energie-Forschungszentrum Niedersachsen

Operated by the Technical University of Clausthal, the Center for Energy Research of Lower Saxony unites the energy research interests of the Technical University of Braunschweig and the Universities of Göttingen, Hanover and Oldenburg. At the Centre, a multi-disciplinary team researches the key aspects of energy science: storage, processing, waste, recycling, law and more. The results of this close integration of research into the highly complex, scientific, technical and socio-scientific issues in the energy sector are used to support the continuous development of energy policy, energy law and energy industry expertise.

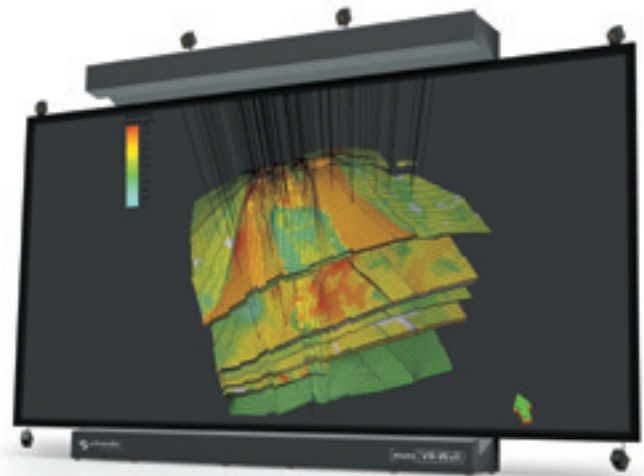
Schneider Digital and 3DInsight: allies in graphics

Schneider Digital develops, supplies and supports customised solutions using its in-house designed PULSARON workstation and AMD professional graphics products. In business for 16 years, the company is renowned for its technical expertise and support and is able to advise impartially on the best choice of graphics solution to meet customer need. For the development of customised projection systems Schneider Digital works closely with 3DInsight, a graphics company based in Chemnitz, Saxony. 3DInsight specialises in the design of high quality but affordable VR installations such as powerwalls and caves using their InsightView renderer or the unique Virtual Graphics Adapter. The latter converts the output of arbitrary graphics applications (e.g.

CAD systems) to allow visualisation of the data on stereoscopic segmented displays.



Customer Prof. Leonhard Ganzer: "Our Mini VR-Wall was installed without the need for costly room redesign and without any architectural changes. Everything worked the first time and there was nothing that did not work. The Mini VR-Wall is simple for us to set up and maintain."

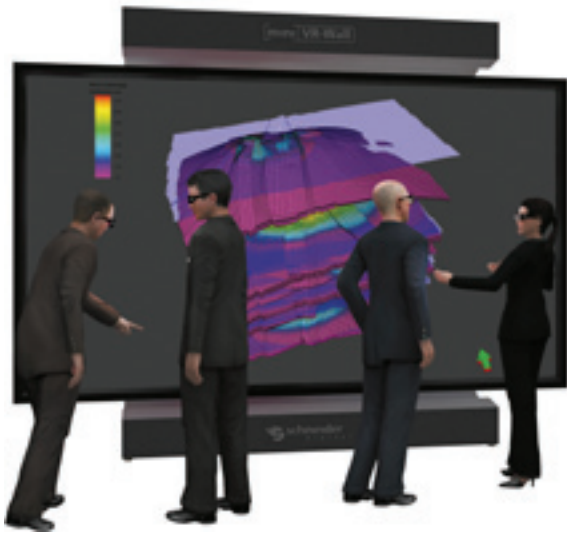


Previous generation of powerwalls are hugely expensive

Dr. Johannes Friebe, Sales Director at Schneider Digital, takes up the story. He says, "Professor Ganzer's team at the Centre for Energy Research uses Petrel™ interpretation software to visualise oilfield structures and the related drilling plans. Touch screen navigation allows the selection of specific drillings and sub-menus show the relevant data and the relationship with other wells. Rather than having a group of researchers sitting around a single monitor, Professor Ganzer needed a virtual reality video wall so that everyone could see the image in full detail." He continues, "However, conventional virtual reality video walls working at a display resolution of 4K – 4096 pixels x 3072 pixels and four times the current 1080 High Definition standard - can cost as much as 250,000 Euros (US \$333,000). Traditional light engines such as video projectors that operate at such high resolutions account for much of that cost." Dr. Friebe adds, "Such walls also need lots of space, use lots of energy and generate lots of heat. You normally need a qualified engineer just to maintain such a system and the calibration and alignment are usually quite difficult."

A new solution at a fraction of the cost

There is now a better, more effective and more affordable solution. The Mini VR Wall is based on technology developed by 3DInsight in close cooperation with Chemnitz University of Technology. It includes novel hardware and software developments for image processing and automatic calibration. The first newly-developed Mini VR Wall has recently been supplied to the Energie-Forschungszentrum Niedersachsen. The Mini VR Wall uses the Schneider PULSARON virtually silent workstation along with the AMD FirePro™ V8800 professional workstation graphics card to deliver a 4K resolution, auto-calibrating, four-display video wall at a fraction of the typical cost of a traditional VR video wall. Future Mini VR Walls should have the option of using the new AMD FirePro™ V9800 graphics.



“The V9800 is a market changer. Suddenly, there is a graphics board with a full frame buffer that can do it all for less than 2.650 Euros, which means that we can deliver a new generation of high-resolution virtual reality video wall at one fifth of the price of the previous generation.”

***Josef J. Schneider,
Chief executive of Schneider Digital***

Twice as much computing capability

The AMD FirePro™ V9800 graphics has the industry's highest memory bandwidth, twice as much computing capability compared with the previous generation and features a scalable ultra parallel processing architecture. The card also supports AMD Eyefinity technology to drive multiple independent displays simultaneously and supports the advanced features of DirectX® 11 & OpenGL® (up to and including OpenGL® 4.2)¹. The AMD FirePro™ S400 Synchronisation Module plug-in sync card can help ensure clock-accurate synchronisation for highly segmented displays. The dedicated processor allows up to four attached AMD FirePro™ V9800s to work in the rendering needs of the user without compromising synchronisation.²

The AMD FirePro™ V9800 professional graphics...its fast...very fast

Dr. Friebe again, “We've tested it and without doubt, the AMD FirePro™ V9800 is fast, very fast. Just one card can hold the complete graphic data in only one frame buffer and allows us to drive six monitors without the need for a sync card.” For highly segmented displays the AMD FirePro™ S400 Synchronization Module plug-in sync card can be used to ensure clock-accurate synchronisation.

AMD Display Library a vital success factor

The cost of display hardware for the Mini VR Wall was reduced significantly by using standard TV monitors rather than a 4K projector. Typically, TV monitors have a longer life than projectors and dissipate far less heat and consume far less electricity, too. However, each segment of the image to be displayed on each monitor had to be synchronised so that they aligned to create the whole image. According to Dr. Friebe, “Using the new Display Library software development kit from AMD, it is possible to adjust the frequency for each output from the AMD FirePro™ V9800 to get perfect alignment. This is a vital factor in making the solution possible.”

Everything worked first time

Commenting, Professor Ganzer says, “Our Mini VR Wall was installed without the need for costly room redesign and without any architectural changes. Everything worked the first time and there was nothing that did not work.” He continues, “The Mini VR Wall is simple for us to set up and maintain. There is no need for any time-consuming and fiddly mechanical adjustment and no need for dedicated and specialist engineers. We just place the camera in front of the video wall, press the calibration button and it is done. The camera in combination with the 3DInsight calibration tool automatically adjusts everything. It takes just ten minutes to achieve a picture that is fully synchronised and fully aligned.” Professor Ganzer adds, “We are using the Mini VR Wall twice a week and always with the stereo option, which is vital in helping us to interpret the subtleties of our geological models.”

AMD FirePro™ V9800 professional graphics: a market changer

Josef J. Schneider is Chief executive of Schneider Digital. In his opinion, “The V9800 is a market changer. Suddenly, there is a graphics board with a full frame buffer that can do it all for less than 2.650 Euros, which means that we can deliver a new generation of high-resolution virtual reality video wall at one fifth of the price of the previous generation. Even the big automotive manufacturers, with the need to see their car designs in full photorealism at 4K usually only have one or two video walls because of the cost and because of the problems of maintenance and calibration. A normal design company certainly would not be able to afford one but now, thanks to AMD, almost every company can justify one.”



The Energy Research Centre in Goslar, called EFZN, is an academic institution of the Technical University of Clausthal in cooperation with the Universities of Braunschweig, Göttingen, Hanover and Oldenburg. In its focus therer are issues relating to the overall energy extraction and energy conversion chain, from raw material source to final disposal. About 80 scientists from the natural sciences, engineering, law and the social and economic science are working together in the EFZN. In this way a cross-disciplinary energy research is possible.



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