VHD Consolidates its 4K Ultra HD Professional Camera Leadership with Zynq® MPSoC

Xilinx Zynq UltraScale+™ Helps VHD Build Industry's Leading 4K60 Ultra HD PTZ Camera to Support both NDI® and 12G-SDI Interfaces

AT A GLANCE:

ValueHD Corp. (VHD) has specialized in the professional audio and video industry for more than 13 years. The company is dedicated to providing global customers with reliable and smart HD and Ultra HD professional cameras, video conference terminals, conference microphones, and related technical services. Its products are broadly used in many applications including business video conferencing, video streaming, e-government, remote education, live streaming, broadcasting, and infrared temperature measurement in 50 countries and regions.

Industry: Pro AV
Head Office: Shenzhen, China
Established: 2008
Website: www.vhd.com.cn

Figure 1 – VHD VX600NF 4K Ultra HD camera

SUMMARY:

High-end video streaming, remote education, video conferencing, and broadcasting, and telemedicine require cameras that feature high definition imaging, zero or light compression, long-distance transmission, low latency, diverse interfaces, and cost-efficiency. Because of the great technical challenges, few solutions in the market are able to fully meet these customer expectations.

As one of only a few UHD camera suppliers, VHD made an important contribution to the popularization of UHD video conference systems with its previous generation of cost-effective proprietary 4K cameras. The latest VX600NF PTZ (Pan-Tilt-Zoom) camera from VHD is the industry's leading 4K60 Ultra HD PST camera to support both NDI and 12G-SDI, bringing high-end PTZ camera technology to a new level. At the heart of this camera is Xilinx's Zynq UltraScale+ EV series adaptive computing platform.

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CHALLENGE:

12G-SDI (12Gbits/s Serial Digital Interface) is a widespread industry standard for transmitting uncompressed and unencrypted digital video signals over a single coaxial cable. 12G-SDI is capable of supporting resolutions up to 4Kp60 and is backward-compatible with HD-SDI (720p/1080i) and 3G-SDI (1080p).

Developed by NewTek, NDI (Network Device Interface) is a high-quality, low latency and multi-channel IP video transmission standard. It is an I-frame, high-bit rate protocol, that has the advantages of ultra-low delay (less than 1 frame) and almost lossless quality. With increasingly thriving video conference streaming applications today, NDI provides a highly cost-effective transmission technology that enables easy cabling and flexible distribution using standard Ethernet.

High-performance conference cameras must accommodate all mainstream types of AV interfaces including HDMI, NDI, and 12G-SDI, as well as provide exceptional image quality and meet stringent size and power consumption requirements. VHD had the vision to build a 4K UHD camera that supports both 12G-SDI and NDI while satisfying various size and power consumption requirements. Therefore, the silicon platform at the core of the design needs to meet much more serious challenges on performance, ISP image processing, system integration, latency, and power consumption.

SOLUTION:

After evaluating various ASIC solutions in the market, VHD selected the Xilinx Zynq UltraScale+ MPSoC EV series adaptive computing platform to design its next-generation video conference camera.

Liang Ming, design director of VHD said, " The highly integrated multi-core heterogeneous architecture of Xilinx's Zynq UltraScale+ MPSoC EV series and its unique hardware programmability brought us unprecedented performance for video encoding and decoding, extensive logic resources to support SDI and NDI, and essential resources that enable us to ensure product competitiveness and successful iterations."

Specially designed for multimedia applications, Xilinx Zynq UltraScale+ MPSoC EV series is an ideal choice for developing highly integrated video conference devices with lower cost, lower power consumption, and better performance. With its 4K60 4:2:2 10-bit codec, it significantly improves the smoothness of UHD images compared to 4K30 8-bit products, leading to more natural colors and seamless color space transitions in images. In terms of coding formats, Zynq UltraScale+ MPSoC EV not only integrates simultaneous encoding and decoding with H.264/AVC, but also H.265/HEVC. At the same bitrate, H.265/HEVC offers better image quality and lower latency, which is critical to many applications, such as video streaming for distance learning.

In addition, the Zynq UltraScale+ EV includes programmable logic, block RAM and DSP that can be used to implement sophisticated image signal processing IP with auto-focus, auto white balance, and auto exposure (3A). Leveraging this platform, VHD built proprietary 4K HDR technology for the VX600NF that can retain the information of brighter parts of images while improving the details of darker parts, leading to significantly improved image quality.

Regarding development tools, Ming also said, "Xilinx Vivado provides a large number of ready-to-use video IP blocks, that significantly reduced the development barrier and shortened our development cycle. By automatically generating a Linux development board support package for embedded processing IP cores, the Petalinux tool greatly simplified the embedded software development process and improved development efficiency."

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RESULT:

With the Xilinx Zynq UltraScale+ MPSoC EV platform, VHD's VX600NF 4K UHD PTZ camera embodies the following breakthroughs:

1. 4K60p raw video transmission.

2. Enables simplified transmission channel through NDI protocol and makes high-quality and real-time editable video network transmission possible.

3. Fills the industry's need for UHD cameras for UHD video conference applications.

4. Enables high-end video conferencing, more sophisticated images, and more powerful ISPs.

5. Consolidates VHD's leadership in the high-end conference camera market.

ADDITIONAL RESOURCES: [Learn More about Xilinx's Videoconferencing Solutions](#)
[Learn More About VHD and it's VX600NF Camera](#)

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