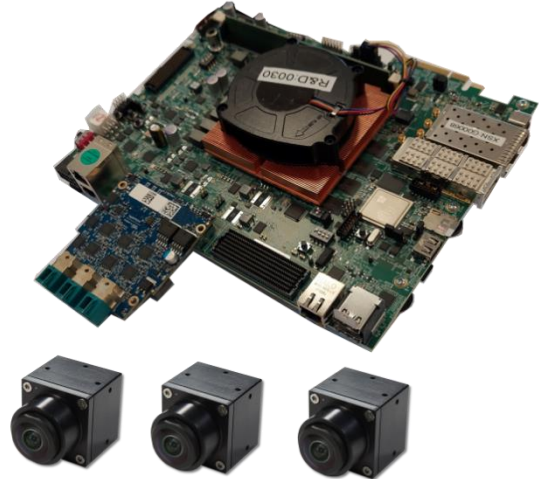


## Xylon d.o.o.

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**Figure 1: logiVID-ACAP-ISP HDR ISP evaluation kit and VCK190 evaluation kit**



Xilinx Versal AI Core Series VCK190 evaluation kit must be purchased from Xilinx and distributors.

## Features

- Complete and flexible ACAP HDR Image Signal Processing framework for embedded multi-camera vision and AI applications
- Prepared for use with AMD-Xilinx Versal Adaptive Compute Acceleration Platform (ACAP) device
- Licensed reference design (logiREF-ACAP-MULTICAM-ISP ACAP HDR Image Signal Processing Framework Reference design) demonstrates a full HDR ISP pipeline for simultaneous processing of three ultra-high-definition automotive video cameras
- Resolutions: IN 3840x1920\* and OUT 3840x2160
- Design fully prepared for the Xilinx Vivado Design Suite 2021.2
- Compatible with AMD-Xilinx PetaLinux
- Provided demo runs on Linux OS and includes logicBRICKS software application prepared for the AMD-Xilinx Vitis Unified Software Platform 2021.2
- Supports the next generation GMSL2 high-speed serial interface from Maxim Integrated
- HDMI™ display output with the Xilinx HDMI 1.4/2.0 Transmitter Subsystem<sup>2</sup> controlled via Xylon's DRM kernel driver
- Complete hardware platform includes:
  - 1x Xylon GMSL2 deserializer FMC module
  - 3x Leopard Imaging automotive cameras
  - 3x Rosenberger FAKRA cables (5 m)
  - 3x Rosenberger HFM to 4x FAKRA cable assemblies
- Documentation and Tech support (e-mail)

<sup>1</sup> Included are 3-month Xylon seat evaluation licenses for the logiISP, logiHDR, logiCVC-ML and logiWIN Xylon logicBRICKS IP cores.

<sup>2</sup> Xilinx licensed IP. Digital code vouchers provided by Xylon to buyers of the logiVID-ACAP-ISP evaluation kit for Versal ACAP.

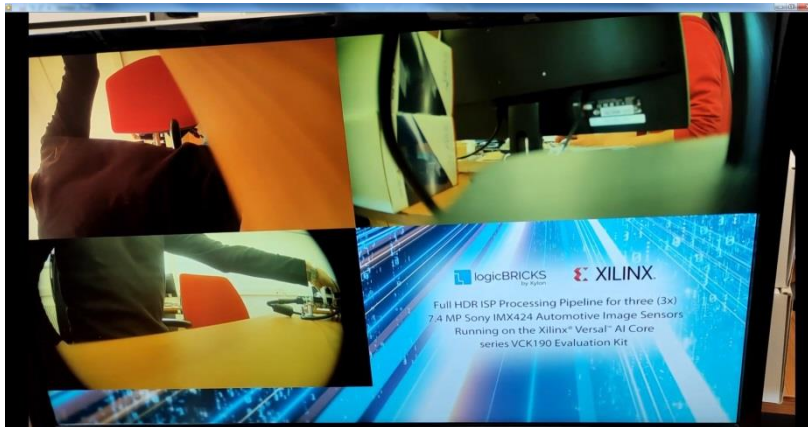
## Applications

- AD/ADAS, AI, guided robotics, drones, machine vision, AR/VR and other vision applications

## General Description

The logiVID-ACAP-ISP HDR ISP evaluation kit for Versal ACAP provides system designers with everything they need to evaluate Xylon's logicBRICKS HDR ISP Suite and to efficiently develop multi-camera vision applications on AMD-Xilinx Versal ACAP devices. The complete hardware platform consists of three Leopard Imaging LI-IMX424-GMSL2 video cameras with raw Bayer video output and Xylon's 12-Ch Automotive Video GMSL2 deserializer FMC module. The kit supports HDMI video output to an Ultra High Definition monitor via the on-board HDMI output port.

Kit deliverables include the complete and licensed logiREF-ACAP-MULTICAM-ISP multi-camera HDR ISP pre-verified reference design with Xylon logicBRICKS IP cores. All IP cores are supplied with Linux software drivers. The video capture and display demo applications run in Linux OS.



**Figure 2: Parallel HDR ISP Processing of three 7.4 MP Automotive Cameras by the logiREF-ACAP-MULTICAM-ISP Reference Design**

## logiREF-ACAP-MULTICAM-ISP ACAP HDR Image Signal Processing Framework

The logiREF-ACAP-MULTICAM-ISP ACAP HDR Image Signal Processing Framework can be fully evaluated with the logiVID-ACAP-ISP evaluation kit designed by Xylon. It is intended to showcase a complete logicBRICKS IP Suite implementation of High-Dynamic Range (HDR) Image Signal Processing (ISP) pipeline in an embedded design based on AMD-Xilinx ACAP programmable devices. The HDR ISP pipeline enables crisp camera video under altering and rough lighting conditions in next generation multi-channel embedded systems for use in automotive, surveillance, medical, aerospace and similar video and vision AI applications.

The design framework implements three parallel video inputs from three 7.4Mpix Leopard Imaging IMX424 GMSL2 video cameras and a UHD display output. All video inputs are stored in the video memory, and by mean of on-board push buttons, the user can select each of them for a single camera or all cameras full screen display.

Key IP cores, the logiISP-UHD ISP pipeline and the logiHDR HDR pipeline, support parallel processing of multiple video inputs, resolutions up to 7680x7680 (including the popular 4K2Kp60 video resolution), merging of two or three exposures, parallel pixel processing and different pixel formats. These IP cores for programmable logic implementations are supplemented with AWB and AE software libraries that use video statistics data collected at video inputs, software drivers, demo applications, reference SoC designs, and bit-accurate C- models.

To get more information about the logiREF-ACAP-MULTICAM-ISP framework, please refer to the following datasheet:

[http://www.logicbricks.com/Documentation/Datasheets/IP/logiREF-ACAP-MULTICAM-ISP\\_hds.pdf](http://www.logicbricks.com/Documentation/Datasheets/IP/logiREF-ACAP-MULTICAM-ISP_hds.pdf)

### Leopard Imaging LI-IMX424-GMSL2 Video Camera

The camera provides 30 Frames per Second (FPS) of raw 7.4 MP (3840x1920) video which is then processed by an external FPGA processor running logiISP and logiHDR as part of the logiVID-ACAP-ISP evaluation kit. Cameras supplied with the logiVID-ACAP-ISP evaluation kit are equipped with the Sony IMX424 image sensor and short coax-cable leads with the Rosenberger FAKRA Z type connector.



Figure 3: Leopard Imaging LI-IMX424-GMSL2 Video Camera

### 12-Ch Automotive video GMSL2 deserializer FMC module

The logiVID-ACAP-ISP evaluation kit comes with the logiFMC-GMSL2 video input FMC card. This add-on card is designed primarily to enable quick prototyping and evaluation of automotive multi-camera Advanced Driver Assistance (ADAS) and Autonomous Driving (AD) applications, and it enables easy interfacing of up to twelve (12) automotive video cameras to hardware boards based on Xilinx's FPGA, SoC, MPSoC and ACAP video and vision processors.



Figure 4: Xylon's logiFMC-GMSL2 FMC Card

## Related Design Services

Design services are available to customers interested in customization and enhancement developments based on the presented hardware and software products. For more information, please contact Xylon at [info@logicbricks.com](mailto:info@logicbricks.com).

## Related Xylon Products

Xylon's logiISP-UHD Image Signal Processing Pipeline IP core is a full high-definition ISP pipeline designed for digital processing and image quality enhancements of an input video stream in Smarter Vision embedded designs based on Xilinx's All Programmable devices. The logiISP-UHD ISP pipeline IP core can be supplemented with the logiHDR High Dynamic Range (HDR) Pipeline. To learn more, please visit our website:

URL: <http://www.logicbricks.com/Products/logiISP.aspx>

The logiHDR is an Ultra High Definition (UHD) HDR pipeline designed for digital processing and image quality enhancements of raw image data from HDR sensors. The logiHDR extracts maximum detail from high-contrast scenes, i.e. scenes with objects highlighted by direct sunlight and objects placed in extreme shades:

URL: <https://www.logicbricks.com/Products/logiHDR.aspx>

Xylon provides software Auto White Balance (AWB) and Auto Exposure (AE) libraries for use with the logiISP- UHD IP core. To get more information about these products, please contact Xylon:

Email: [info@logicbricks.com](mailto:info@logicbricks.com)

## Ordering Information

Products are available directly from Xylon. Please visit our web shop or contact Xylon for pricing and additional information:

Email: [sales@logicbricks.com](mailto:sales@logicbricks.com)

URL: <http://www.logicbricks.com/Products/logiVID-ACAP-ISP.aspx>

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## Related Information

### Xilinx Programmable Logic

For information on AMD-Xilinx programmable logic or development system software, contact your local AMD-Xilinx sales office, or:

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## Revision History

Version	Date	Note
1.00	17.10.2022	Initial public release.



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