

# Design Flexible 4K Video FPGA Systems with DisplayPort™ 1.4 Connectivity

Develop high-performance, customizable video solutions with DisplayPort™ 1.4 connectivity using Intel® Cyclone® 10 GX FPGA Development Kit and Intel® FPGA VIP IP Suite



## Solution

Intel's extensive, industry standard, and interoperability-tested connectivity intellectual property (IP) provides the flexibility and reliability to input and output a large variety of video formats. In a market with constantly changing standards, you can upgrade to the latest video-over-IP solutions to adapt your product continuously without switching out the hardware. Additionally, our modular Intel® FPGA Video and Image Processing IP Suite (Intel® FPGA VIP IP Suite) provides a portfolio of highly tuned off-the-shelf IP. With connectivity and Intel FPGA VIP IP Suite, designers can combine modular blocks with the latest IP to build a flexible video framework that is agile and responds quickly to the rapid design changes in today's competitive video market. With Intel's advanced software tools, you can build a professional, customized solution that scales to support any product requirement.

The DisplayPort™ Intel® FPGA IP for Intel® Cyclone® 10 GX FPGA design example makes it easy for you to evaluate our DisplayPort™ IP solution on an Intel Cyclone 10 GX FPGA Development Kit. Intel also provides a step-by-step tutorial on how to create custom video processing applications using the high-quality, plug-and-play portfolio of in-house video processing IP from the Intel® FPGA VIP IP Suite.

Customer benefits:

- Low cost way to evaluate VESA DisplayPort™ standard version 1.4. in an Intel FPGA.
- Several design example IP available from and supported by Intel.
- Verify functionality and performance of Intel video connectivity and processing IP using the free Intel FPGA IP Evaluation Mode.
- Free four-part instructor-led video series provides instructions on how to create a custom video pipeline using the design example.
- Edge-centric FPGAs— Intel Cyclone 10 GX FPGAs—are optimized for high-bandwidth performance and cost-sensitive applications

## Authors

**Evan Pandya**

Strategic Marketing  
Intel Programmable Solutions Group

**Francisco Perez**

Field Application Engineer  
Intel Programmable Solutions Group

## Background

In today's highly competitive market for video and vision applications, it is important that engineers create flexible designs that differentiate against new market entrants that use off-the-shelf products. The ubiquity of video technologies and increasing demand for more complex use-cases in which devices are connected to the edge and cloud means that the video-application market continues to evolve with these new technologies:

- 4K Ultra High Definition (Ultra HD) and higher resolutions, the shift to video over IP, and the use of artificial intelligence for video analytics
- New form factors, such as interactive display modules, and new video connectivity standards, such as DisplayPort™ 1.4

Intel FPGAs enable high-performance core processing and connectivity for competitive video solutions by offering deterministic low-latency and high-performance hardware customization in reprogrammable silicon fabric. This intrinsic flexibility combined with Intel FPGA's modular IP architecture, pre-canned IP cores, and development kit hardware and design examples enables original equipment manufacturers (OEMs) and custom video solution providers alike to quickly add new features or accommodate end customer-specific requirements for a wide range of video markets.

## Target Applications

As video-based technologies continue to evolve and proliferate throughout the world, we now find video practically everywhere—from our tiny handheld mobile devices to the massive billboards and video walls that stud our urban cityscapes. Video continues to occupy a progressively central role in our everyday lives, meaning that the use-cases for video applications continue to diversify and grow in scope and scale. Some market-leading applications include:

- Studio broadcast
- AV networking (ProAV)
- Medical imaging
- Digital signage/projection, video walls
- Interactive whiteboard/video conferencing
- Cameras and accessories
- Video servers, switchers, routers, and multiviewers
- Consumer/prosumer applications



## Learn More

- [Edge-Centric Overview Page](#)
- [Buy the Intel Cyclone 10 GX FPGA Development Kit](#)
- [Buy the DisplayPort™ daughter card](#)
- [DisplayPort™ Intel® FPGA IP Core](#)
- [Intel FPGA Video and Image Processing IP Suite](#)
- [Intel Cyclone 10 GX FPGAs](#)



No product or component can be absolutely secure.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Performance varies by use, configuration and other factors. Learn more at [www.Intel.com/PerformanceIndex](http://www.Intel.com/PerformanceIndex).

Your costs and results may vary.

Intel technologies may require enabled hardware, software or service activation.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.

DisplayPort, DisplayPort Compliance Logo, DisplayPort Compliance Logo for Dual-mode Sources and DisplayPort Compliance Logo for Active Cables are trademarks owned by the Video Electronics Standards Association in the United States and other countries.