# FPGA Design

## LOW POWER, SMALL SIZE, PROGRAMMABLE.

At Fidus Systems, we understand the unique challenges faced by technology companies – too many projects and too few engineering resources. With top engineering talent, multiple design centers and on-site staffing options, Fidus provides highly responsive engineering teams that are an extension of your development team to successfully bring products to market faster.

Recognized as a trusted design partner, Fidus is dedicated to meeting customer expectations, and developing long-term relationships with clients built on integrity, quality and open communications.

Fidus is pleased to provide customers with full end-to-end development solutions or more selective targeted engagements.

Fidus has delivered more than 4000 projects for 400+ clients, from Tier-1 multinationals to SMEs to start-ups. Fidus is headquartered in Ottawa, Canada with Design Centers in Ottawa, Kitchener-Waterloo and San Jose, CA.

### HOW WE HELP

Do you want to: Increase your revenue? Reduce your costs? Increase your speed and flexibility? Focus on your core competency? Consider Fidus for electronic product development and consulting services.

Fidus has extensive experience in designing with low-cost CPLDs up to the largest FPGAs in the world. Being a Lattice Design Services member means that we are trained and adept at selecting and implementing the most advanced Lattice devices and tool flows.

Our FPGA design team's skills are readily complemented by Fidus' Hardware, PCB Layout, Signal Integrity, Verification, Embedded Software, and Mechanical design expertise.
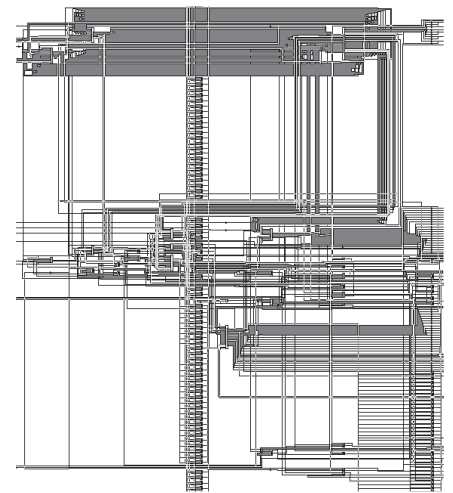
### DESIGN EXPERTISE

**Turnkey:** FPGA and ASIC design, validation and verification, and documentation solutions

**Device selection:** Identifying the best device to get the job done

**Device retarget:** Helping you migrate from one FPGA to another

**Languages:** Verilog®, VHDL, SystemVerilog

**Embedded Vision:** Cameras, AI at the edge, hardware security

**High-Reliability:** Datacenter, Aerospace, Automotive, Military, Medical

**IoT:** Low-cost, low-power mesh, low-power

**Robotics and Automation**

**IP Development:** MIPI, HDMI, Video aggregation, XAUI, DisplayPort™

**Various Neural Networks**

**Multi-Gigabit Serial Links:** PCIe® Gen4+, JESD204B/C, CPRI, LTPI

**Memory Interfaces:** (LP)DDR4/DDR5, SRAM, NVMe™, etc.

**Video:** DisplayPort™, MIPI, HDMI®, image processing, scaling, overlay, PiP, soft-core processor engine with DMA interfaces, etc.

**IP Core Development:** Differentiated custom solution blocks that are fully documented and verified, including DSP

**Experience with:** General Purpose (ECP2/M, ECP3, ECP5 / ECP5-5G, Avant), Video Bridging and Processing (CrossLink), Low Power, Control and Security (Mach), and other programmable logic families

TOOLS FOR DEVELOPMENT

Diamond Software, Radiant Software, Neural Network Compiler, iCECube2, Lattice SensAI, mVision, Sentry, Automate, Drive

## EXAMPLES OF OUR TECHNOLOGY

- **HDCP IP core development:**
  HDCP designed, tested, and integrated
  - HDCP 1.3 for DisplayPort
  - HDCP 1.4 for HDMI

- **Video aggregation of 10 video streams into a single custom fiber link**

| VIDEO | NETWORKING/STORAGE | PROCESSING | ACCELERATION |
|---|---|---|---|
| Aggregation (multi-stream) | NVMe, SSD | Color space conversion | Acceleration IP |
| Stereo Vision (AR/VR, medical) | 100GE+ | Region of Interest | Graphics Acceleration |
| Processing (ISP, ROI, Overlays, Encode/Decode, HDCP) | PCIe Gen 4+ | Overlays and transformation | CNN Acceleration |
| Acquisition and Display (HDMI, SDI, DP, MIPI, LVDS) | (LP)DDR4/5+ | Encoding/Decoding | Hardware Acceleration using Ultra Low-Density FPGAs |
| Frame Buffers | | Compression/Decompression | |

## EXAMPLES OF OUR WORK

- **Video Board for Motion and Control Technologies** for oil and gas, leveraging CrossLink-NX (LIFCL-40-7BG256I) with Radiant
- **Video MIPI DSI input to MIPI DSI with low latency processing unit for VR application**
- **Video protocol conversation from and to SDI DP, HDMI, MIPI**
- **Application: Aggregating 4x MIPI cameras to CrossLink device for video gaming**
  - VR headset with 4 tracking cameras to USB
- **Application: Camera aggregation for position identification in surgical robotics**
  - FPGA IP design to integrate the 3 camera sensors
  - CrossLink LIF-MD6000-CSFBGA81
- **Application: Streaming Video across LTPI**
  - Leveraging the MachXO5-NX and Lattice's LTPI IP Core to stream live video and typical control information



**■■■LATTICE**
SEMICONDUCTOR®
**PARTNER**

### LATTICE PARTNERSHIP

As a Lattice Partner, Fidus receives exclusive training, certification, and early-access to tools, IP, and new silicon. So what does this mean? It means that when you hire Fidus, you know that Fidus is on the forefront of the Lattice roadmap, experienced in the most advanced tool flows, and is top of mind within the Lattice support network.

# fidus
**innovate·design·deliver**

**fidus.com**

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