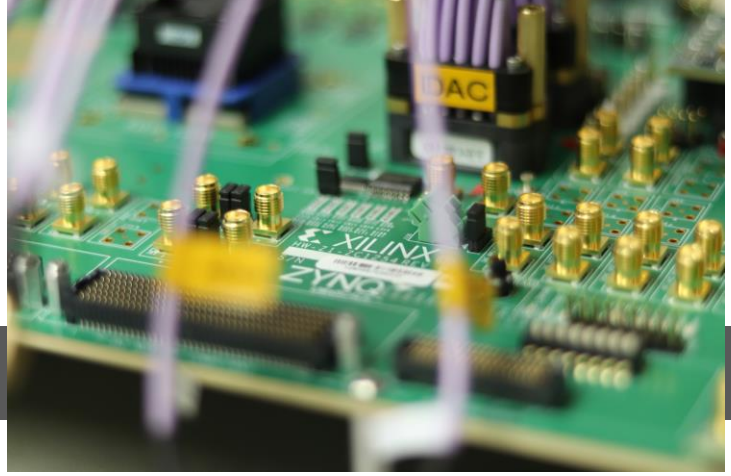
Xilinx FPGA Design and IP Solutions

By DornerWorks



An FPGA can improve your project, but starting a new FPGA design can be a daunting process.

With the complexity of the system components, multi-core SoCs, IP available from a variety of sources, and a need to learn the tools, it's a challenge to get it all done.

Is there a simpler way to harness the advantages of this technology?

Our expertise, your success

Our approach begins from your requirements, and builds incrementally to an optimal solution, whether it takes the form of high performance **MPSoC** or **RFSoC**, or *any other FPGA design goals you want to reach*.

We can build from an idea, through rapid prototypes (such as with **Xilinx SDSoC**), to a fully customized logic solution, depending on your budget and performance requirements. Not only can we handle your FPGA development, we can help you create the embedded software, electronics hardware, or test systems solutions you need to move forward.

Xilinx integrated design solutions

- **Turnkey Solutions**: Requirements Development, Design, Validation, and Documentation
- **Design Migration**: Replacing discontinued parts with FPGAs and CPLDs, migrating designs to the latest technology
- **Algorithm Development & Acceleration**: Xilinx SDSoC/HLS, C/C++, Matlab, Simulink
- **Separation**: Open-source Xen hypervisor support for Zynq US+ MPSoC devices, Safety/Security fault mitigation
- **IP**: AES Cryptographic IP, Ethernet AVB MAC, Network Time Synchronization

Tools

- **FPGA**: ISE, Vivado
- **Embedded**: EDK, SDK, SDx
- **Simulation**: Vivado, Mentor Graphics QuestaSim
- **Debug**: Chipscope, Vivado Logic Analyzer, Xilinx Virtual Cable (XVC)

Key capabilities

- **Functional Safety**: DO-254, ISO262
- **Video**: Demosaic, Filter, Color Space Conversion, Scaling, Overlay, Image Fusion
- **Communication Protocols**: Ethernet, TCP/IP, AVB, TSN, IEEE 1588v2, PCIe, ARINC 429
- **DSP**: Transforms, Filters, Windowing, Radar Signal Processing
- **I/O Interfaces**: JESD204, Gigabit Serial, PCI
- **Processors:** Microblaze, Picoblaze, ARM Cortex-A9, ARM Cortex-A53
- **Devices:** Zynq UltraScale+, RFSoC, Zynq-7000, Artix, Kintex, Virtex
- **Memory Interfaces**: DDR2/3/4, SRAM, Flash, SDIO
- **Safety/Security**: Security Monitor (SecMon), Isolation Design Flow (IDF), Partial Reconfiguration, Modular Redundancy, Lock-step
- **Languages**: VHDL, Verilog, SystemVerilog, C/C++

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Product Development | Hardware | Software | **FPGA** | IoT | Security | Separation Technology | Test Systems

Proven experience, on your side

We understand how challenging it can be to design for an FPGA-based system.

As one of just a few Premier Members of Xilinx's Alliance Program, we have created many FPGA and SoC designs for numerous companies, and as one of even fewer in the world with RFSoC experience, we're bringing even more innovation to cutting edge technology projects.

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You can depend on DornerWorks expertise to architect your solution, lower the risk on your project, and accelerate your time to market.

FPGA solutions case studies

Defense-Class AVB Networking

The DornerWorks MAF Endpoint FPGA IP was implemented in a system that detects and mitigates the threat of oncoming airborne explosive devices around the perimeter of military ground vehicles. It relies on a standards-based MAC custom designed to meet the demands for MAPS, and features an integrated and highly accurate gPTP module with 8ns accuracy and credit-based and strict-priority scheduling. The 1772 AVB Encapsulator simplifies integration into existing systems. Simply stream sensor data in to the IP and it's on the wire.
The FPGA logic in DornerWorks MAF Endpoint IP solution was developed for Xilinx FPGAs. As part of the MAC IP, it enables support for multiple types of heterogeneous traffic over a common network to reduce infrastructure costs.
Technologies: Xilinx Zynq-7000, ARM Cortex-A9, CW Radar, FFT, DMA, AXI

Autonomous Vehicle Video Capture System

DornerWorks provided an FPGA solution for an advanced driver-assistance system (ADAS) that optimized the data ingestion from up to 12 simultaneously streaming cameras. System level design and IP implementation was provided for a PCIe connected multi-camera video capture system for use in autonomous vehicle platforms. The cameras interfaced using MIPI CSI-2 and parallel I/O. The system captured greater than 30 Gbps of RAW video at 30 fps, with camera resolutions up to 12 mega-pixel, and output greater than 55 Gbps of combined RGB and Grayscale video over multiple PCIe 3.0 interfaces to the rest of the system for additional processing and logging.
Technologies: Xilinx Zynq UltraScale+, ARM Cortex-A53, Video, MIPI CSI-2, PCIe

Radar Processing

For a system that searched for and identified moving targets with concealed explosive devices, DornerWorks successfully reduced the size, weight, and power costs of an existing radar system on an AVNET MicroZed with a Zynq-7000 device, optimized data throughput speeds, and integrated the customers' existing ADC capture logic to receive ADC samples. The ADC samples were processed using a Range FFT followed by a Doppler FFT to produce a Range-Doppler map. Existing customer software was split into functionality implemented as FPGA IP blocks and functionality run on the Zynq-7000 dual Cortex-A9 processor to balance performance and development schedule.
Technologies: Xilinx Zynq-7000, ARM Cortex-A9, CW Radar, FFT, DMA, AXI

Companies that dive into FPGA development can wind up wasting time and resources on a product that *doesn't work*. We collaborate with you to innovate your FPGA product, so you feel confident working with a new platform.

Get started today!

Our simple 3-step plan will determine a technology development course of action that best fits your needs.