DesignWare IP Prototyping Kits

Highlights

- Instant productivity for software development and IP integration
- Fully tested and pre-validated IP configuration that can be easily modified
- Proven, preloaded hardware, and software reference designs
- Software Development Platform running Linux® OS and reference drivers
- Scripts and configuration files to enable fast iteration
- Plugs into open source software tool chains
- Expandable and scalable to multiple IP interfaces and an entire SoC

Overview

The DesignWare® IP Prototyping Kits, part of the IP Accelerated initiative, center around a complete, out-of-the-box reference design that consists of a validated IP configuration and necessary system-on-chip (SoC) integration logic for a specific IP protocol, implemented on a Synopsys FPGA-based prototyping system.

With a proven reference design for the IP, designers can be instantly productive, enabling them to accelerate the integration of IP into their target SoC, optimize the IP configuration, and develop drivers and software applications with real world I/Os and hardware. The prototyping kit provides prototyping hardware with automation tools, and scripts and configuration files enabling fast iteration.
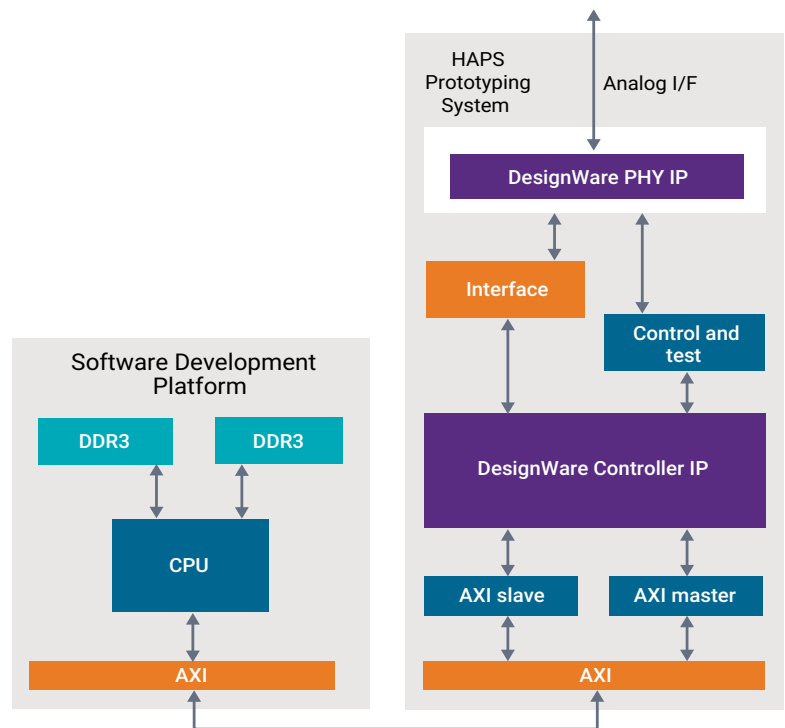

Figure 1: DesignWare IP Prototyping Kit Block Diagram

HAPS-80 Soft IP Prototyping Kits

If you already have a HAPS-80 system in house and have licensed the IP core, you can use software-based IP Prototyping Kits which are compatible with your existing system. HAPS-80 Soft IP Prototyping Kits do not include hardware.

Deliverables

- FPGA reference design
  - Verilog source code
  - Simulation testbench
  - ProtoCompiler synthesis scripts
  - Vivado place and route scripts
  - FPGA pre-built image
- Software
  - Driver source code
  - Compilation scripts
  - Software pre-built image for ARC® AXS101 Software Development Platform (SDP)
- Documentation
  - User guide
  - Installation guide
  - Release notes
- Support channel

HAPS-DX IP Prototyping Kits

HAPS-DX is the standard FPGA platform which provides the features needed to prototype a single IP with high flexibility to reconfigure and connect it to multiple FPGA platforms. Designers can build a quick prototyping environment.

- Deliverables:
  - HAPS-DX Prototyping System
  - ARC AXS101 SDP (for ARC models)
  - PHY interface card available for: MIPI, USB, PCI Express® (PCIe), HDMI, and SATA
  - Cables
  - Power supply
  - SD cards
  - PCIe® MGB Kit (for Host PC model)
  - PCIe Gen3/Gen4 backplane
  - Xilinx Virtex®-7 690T FPGA device
  - I/O interfaces compatible with FPGA Mezzanine Card (FMC) and HAPS HapsTrak 3
  - ProtoCompiler DX
  - RTL debug and high-capacity storage options
  - Interface for design troubleshooting and protocol compliance checks
  - Integrated Universal Multi-Resource Bus (UMRBus) hardware interface and C/ C++/Tcl APIs

IP Prototyping Kit Processor Compatibility

IP Prototyping Kits come in multiple hardware/software configurations to meet your exact IP prototyping needs. The target IP core can be implemented on Synopsys' HAPS-DX or HAPS-80 FPGA-based prototyping system using many different processors:

- ARC processor-based 32-bit SDP running Linux
- PCIe connection to a PC with any processor

ARC AXS101 Software Development Platform

The IP Prototyping Kits' ARC AXS101 SDP serves as a single-board Linux computer system that can boot the supplied Linux image. The AXS101 consists of an ARC AXC001 CPU card with an associated software package of pre-built operating systems, drivers, and examples mounted on an ARC AXS101 SDP mainboard. The ARC AXS101 SDP comes with a rich set of I/O including an HDMI connector that designers can use to connect a display and a keyboard used to program and operate the IP Prototyping Kit.

The ARC AXS101 SDP mainboard features a USB dataport combined with a converter, which provide a JTAG debug interface and a debug console via a single USB cable. Additionally, industry-standard debug probes from Ashling and Lauterbach are also supported. Separate UART interfaces for a debug console are available as well.

PCI Express Connection to a PC

Users also have the option of using the processor on the host PC as their software development target. The PCIe interface hardware (PCIe MGB kit) connects the HAPS-DX system to a host PC through a PCIe cable (Figure 2). This platform is ideal for software engineers who want to develop and test software drivers for the interface in a Linux environment.
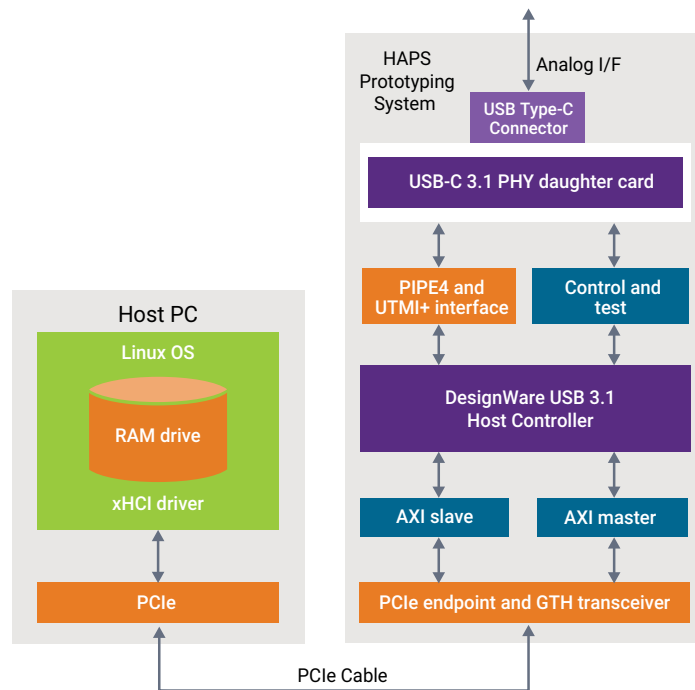

Figure 2: Example of USB 3.1 Host Controller with PCIe Connection to PC

About DesignWare IP

Synopsys is a leading provider of high-quality, silicon-proven IP solutions for SoC designs. The broad DesignWare IP portfolio includes logic libraries, embedded memories, embedded test, analog IP, wired and wireless interface IP, security IP, embedded processors, and subsystems. To accelerate prototyping, software development and integration of IP into SoCs, Synopsys' IP Accelerated initiative offers IP prototyping kits, IP software development kits, and IP subsystems. Synopsys' extensive investment in IP quality, comprehensive technical support and robust IP development methodology enable designers to reduce integration risk and accelerate time-to-market.

For more information on DesignWare IP, visit synopsys.com/designware.