



Hardware Development Kit

When configurability matters, Abaco is there

The flexibility and performance of low level, and simplicity of high-level FPGA design

The Hardware Development Kit (HDK) is a development tool that allows users to develop unallocated Xilinx, Inc. FPGA resources on Abaco boards. The HDK uses specific features in the new Xilinx Vivado ML Editions tool suite which allow users to implement custom intellectual property (IP) while maintaining the overall integrity of the Abaco IP.

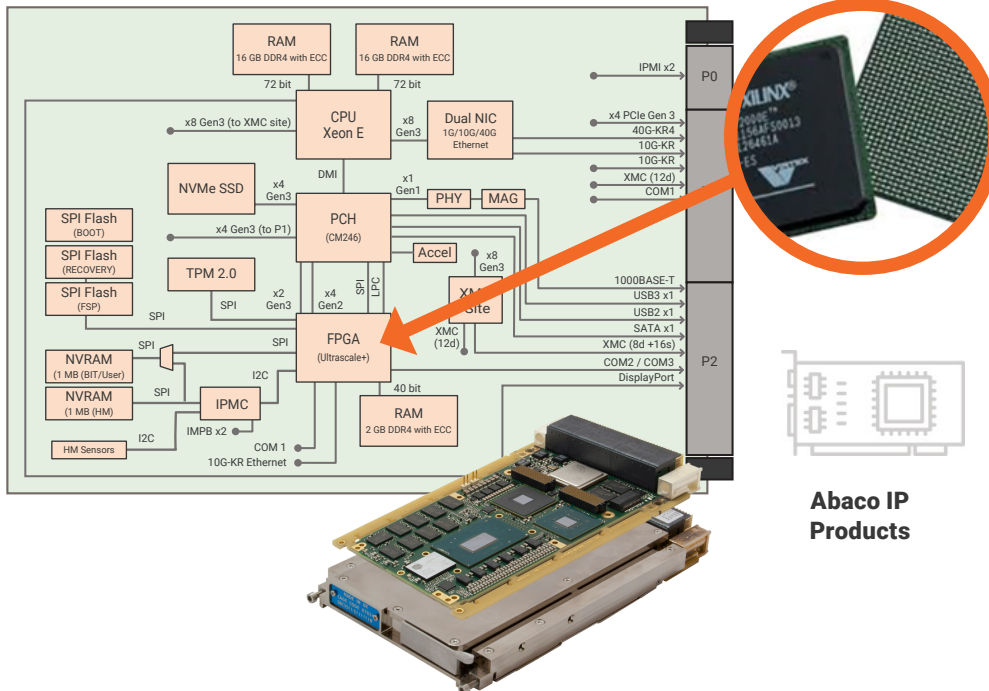
Building on the capability of the Xilinx Dynamic Function eXchange (DFX) feature, Abaco develops a static design comprised of their proprietary IP, while making room in

the FPGA for a dynamically programmable region, for their user's custom designs. During the development process, Abstract Shells are used to only compile the dynamic region, thus accelerating compile times and protecting Abaco's IP.

At runtime, DFX is used to swap designs in and out of the dynamic region. The HDK includes a static partition bitstream, Vivado ML reprogrammable partition example design, and build scripts for implementing the abstraction layer interfaces.

FEATURES:

- **Efficient:** Abstract Shells safeguards the Abaco IP while speeding up compile time within the Xilinx Vivado toolset.
- **Simple to Use:** Fully integrated with the Xilinx Vivado tool, it offers the HDL designers a seamless working environment.
- **Customizable:** Make an efficient use of the reminder of the FPGA resources by layering multiple bitstreams.
- **Integrity:** Preserve HW integrity by partitioning the FPGA resources which are needed for the HW.
- **Security:** With the system's security level in mind, the HDK integrates into the Root and Chain of Trust preserving the intrinsic security which the system already defines.



Abaco IP Products



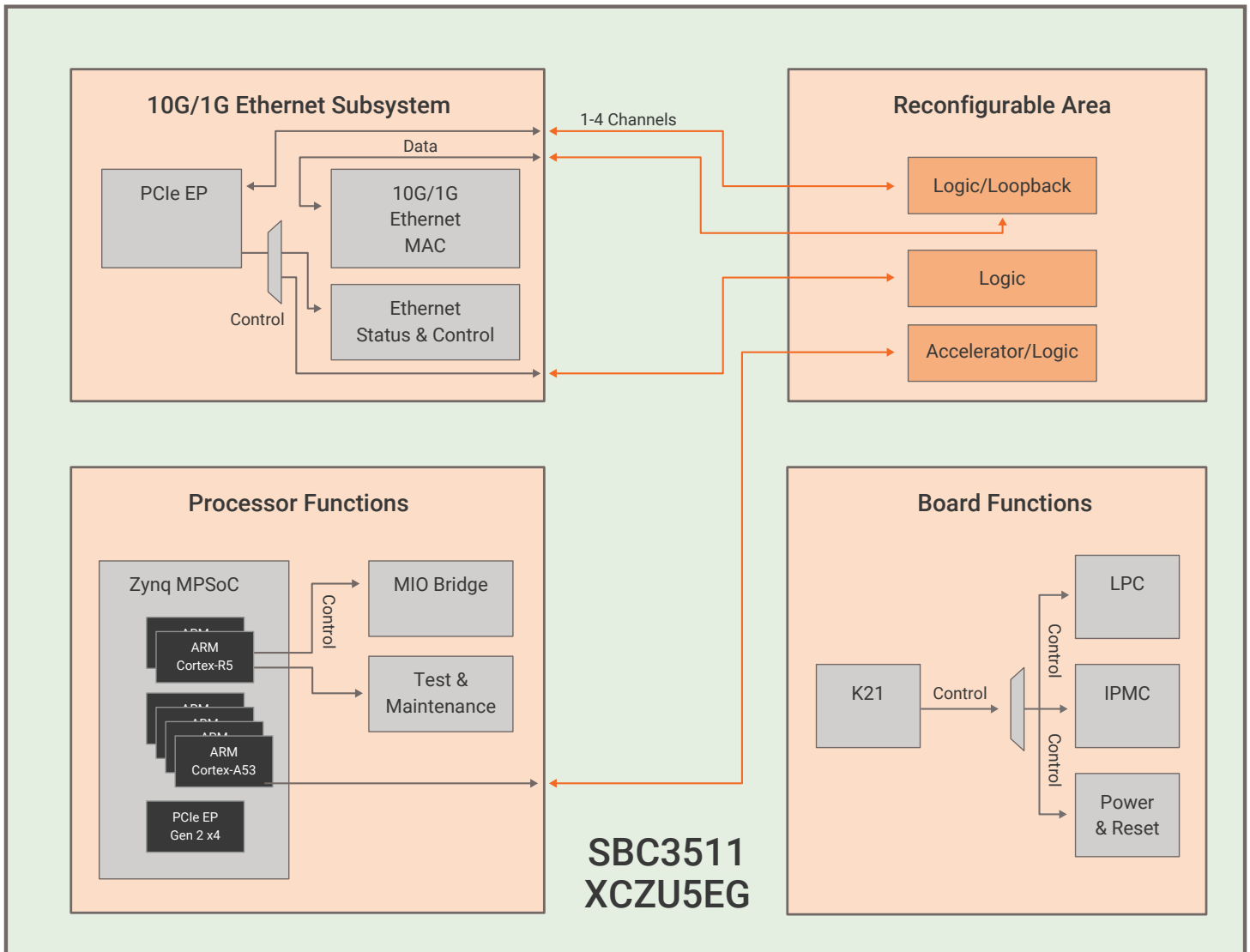
Abaco Proprietary Interface



Customer IP



Combining flexibility and simplicity on customized blocks



Block diagram of the IP blocks deployed for the SBC3511 platform.

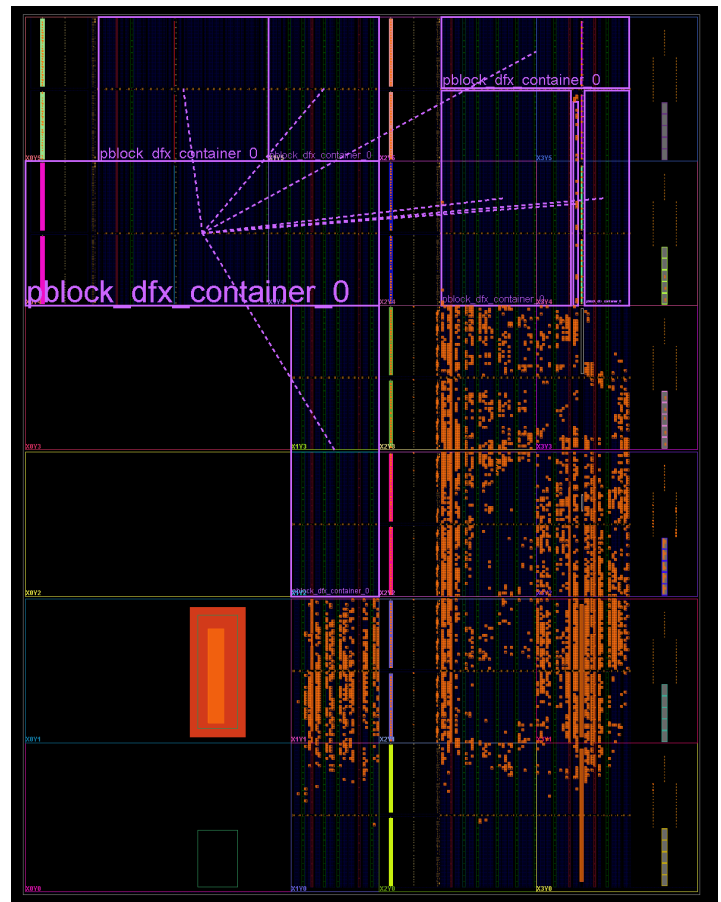
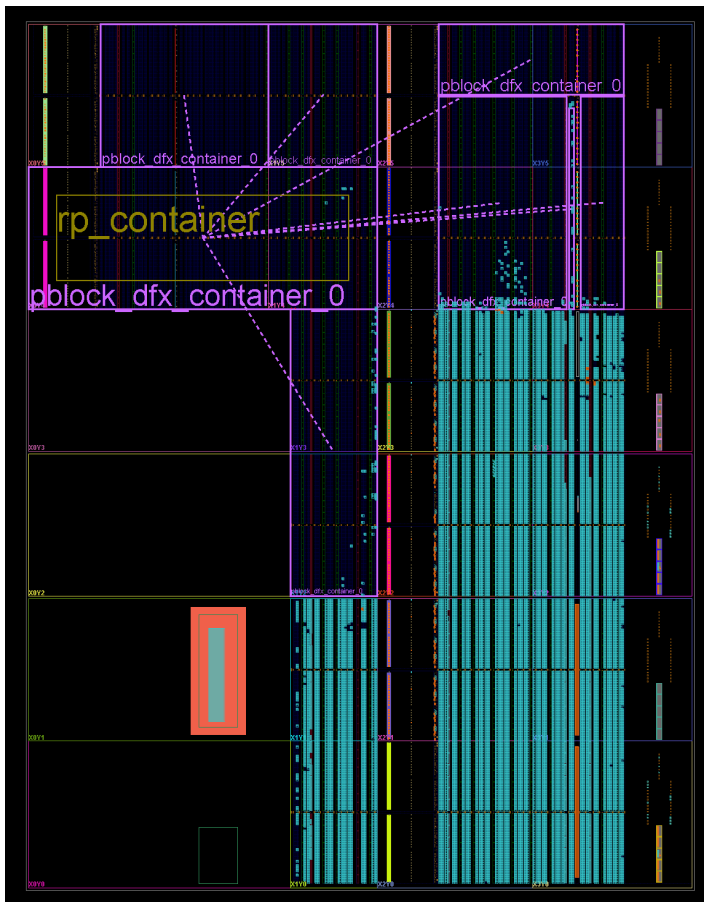


The development environment

Building on the concept of Xilinx Dynamic Function eXchange (DFX), Using Vivado 2020.2 and forward, Abaco develops a static region of the programmable logic resources for their own IP and/or licensed IP from Xilinx or another third-party. They allocate a reprogrammable partition of the unused and available logic resources for end-customer proprietary IP implementation. Users can access resources in the static partition from the reprogrammable partition by creating an abstraction layer utilizing the new Abstract Shells feature within Vivado.

The HDK includes a static partition bitstream, Vivado reprogrammable partition example design, and build scripts for implementing the abstraction layer interfaces.

The Abaco HDK is a powerful new tool allowing end-customers to harness the power of available programmable logic resources within our embedded electronic platforms.



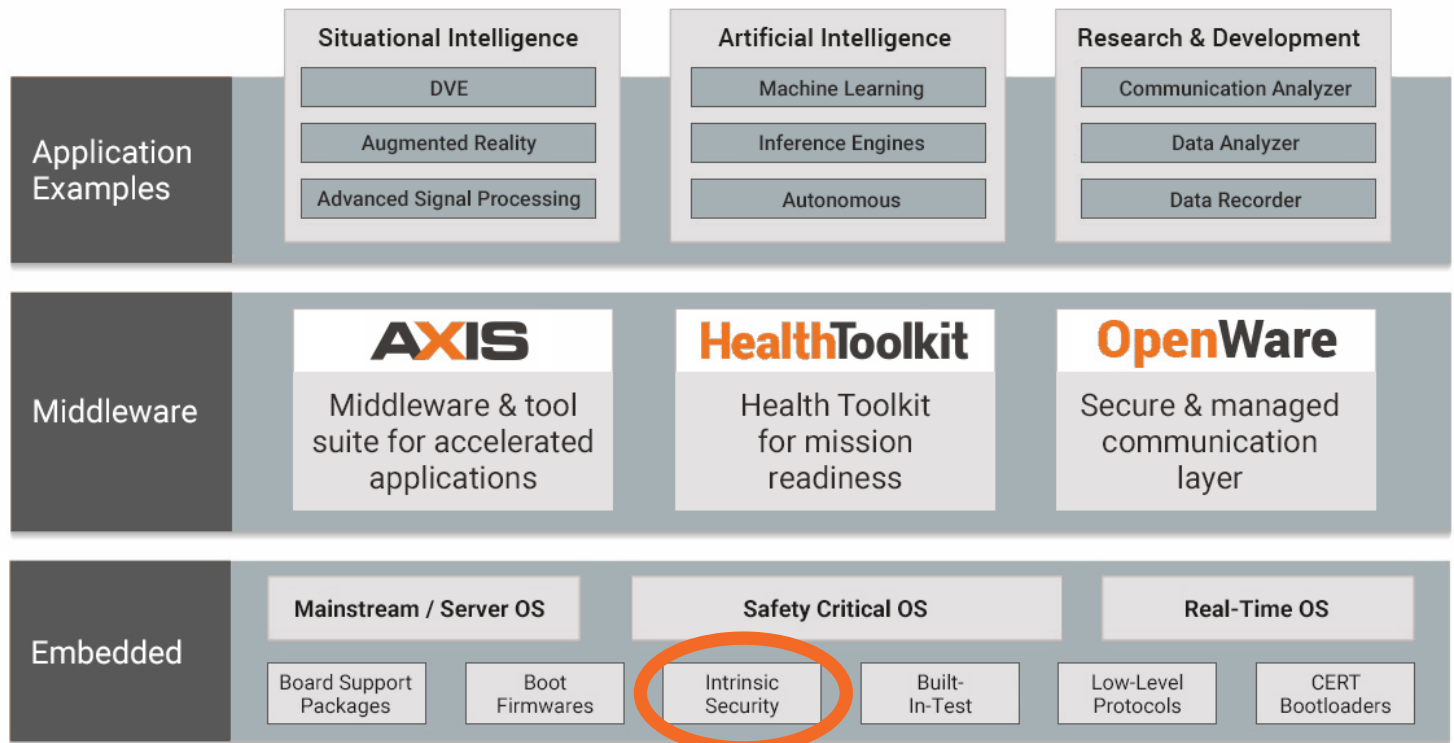
Customer's reserved area in purple (both pictures). On the left, the device view of the full design (placed logic in blue and reconfigurable partition outlined in purple). On the right, the device view of the corresponding abstract shell from the customer perspective (border elements in orange and reconfigurable partition outlined in purple).



Fitting nicely in the Abaco SW offerings

The HDK complements the Firmware section of Abaco's Embedded Software Suite, and integrates into the intrinsic security infrastructure.

Although the product does not include security enhancement per se, the HDK is designed to be aware of the intrinsic security features designed into the platform.





Product features and ordering information

PRODUCT P/N	HARDWARE SUPPORTED	FEATURES	FPGA RESOURCE USAGE APPROX. AVAILABLE / DEVICE-TOTALS	MARKET SEGMENT
SHDK-S3511-01M / A	SBC3511 (security hardware variant)	• 1/10GbE MAC • COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • Intrinsic Security (CSU Enabled)	CLB LUTs (K): 61 / 117 CLB Registers (K): 122 / 234 Block RAM Tiles: 90 / 144 DSP Slices: 768 / 768	Abaco's SL 2, 3 and 4
XHDK-S3511-01M / A	SBC3511 (other hardware variant)	• 1/10GbE MAC • COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • FPGA constrained. • Activation Key for the specific SBC serial number	CLB LUTs (K): 61 / 117 CLB Registers (K): 122 / 234 Block RAM Tiles: 90 / 144 DSP Slices: 768 / 768	Abaco's SL 0 and 1
SHDK-S3511-01R	SBC3511 (all variants)	• Activation Key for the specific SBC serial number	-	-
SHDK-S6511-01M / A	SBC6511 (security hardware variant)	• COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • Intrinsic Security (CSU Enabled)	CLB LUTs (K): 120 / 230 CLB Registers (K): 240 / 460 Block RAM Tiles: 140 / 312 DSP Slices: 860 / 1728	Abaco's SL 2, 3 and 4
XHDK-S6511-01M / A	SBC6511 (other hardware variant)	• COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • FPGA constrained	CLB LUTs (K): 120 / 230 CLB Registers (K): 240 / 460 Block RAM Tiles: 140 / 312 DSP Slices: 860 / 1728	Abaco's SL 0 and 1
SHDK-S6511-01R	SBC6511 (all variants)	• Activation Key for the specific SBC serial number	-	-
SHDK-IPN254-01M / A	IPN254 (security hardware variant)	• COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • Intrinsic Security (CSU Enabled)	CLB LUTs (K): 120 / 230 CLB Registers (K): 240 / 460 Block RAM Tiles: 140 / 312 DSP Slices: 860 / 1728	Abaco's SL 2, 3 and 4
XHDK-IPN254-01M / A	IPN254 (other hardware variant)	• COTS API/hooks • 1x Activation License (per-device) • 160 Hrs of dedicated support • FPGA constrained.	CLB LUTs (K): 120 / 230 CLB Registers (K): 240 / 460 Block RAM Tiles: 140 / 312 DSP Slices: 860 / 1728	Abaco's SL 0 and 1
SHDK-IPN254-01R	IPN254 (all variants)	• Activation Key for the specific SBC serial number	-	-



WE INNOVATE. WE DELIVER. **YOU SUCCEED.**

Americas: 866-OK-ABACO or +1-866-652-2226

Europe, Africa, Middle East, & Asia Pacific: +44 (0) 1327-359444

Locate an Abaco Systems Sales Representative visit: abaco.com/products/sales

abaco.com

©2021 Abaco Systems. All Rights Reserved. All other brands, names or trademarks are property of their respective owners. Specifications are subject to change without notice.

SWDS-HDK-EAR99-0721