# ChipVORX®

Basics and Applications
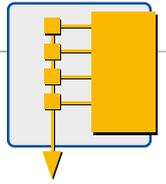
- ⊘ **Technology provides instrument control through JTAG port**
- ⊘ **Enables at-speed tests and parameter measurements**
- ⊘ **High-speed flash programming**
- ⊘ **Re-configurable software-IP solution, no synthesis needed**
- ⊘ **Completely integrated in SYSTEM CASCON™ tool suite**

ChipVORX® is a ground-breaking technology for the universal control of Chip-embedded Instruments through the JTAG port of a device under test.

The functionality of the instruments is determined by the chip designer (hard-macro), or by an end-user in the case of a field programmable gate array (FPGA) device (soft-macro). The instruments can be of various types, performing test functions as well as measurement or programming functions.

ChipVORX is based on the principle of software re-configurable instrumentation, i.e. all software tools and the associated hardware are adapted for the target function by means of specific IP (ChipVORX models). This solution provides extraordinary flexibility and openness, especially in FPGA based applications.
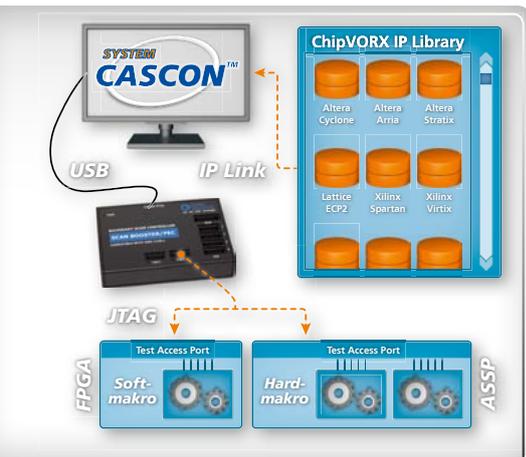
ChipVORX®

Re-configurable ChipVORX control through Software-IP
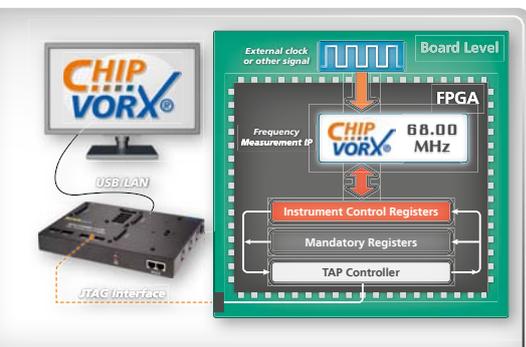
Example ChipVORX application for frequency measurement
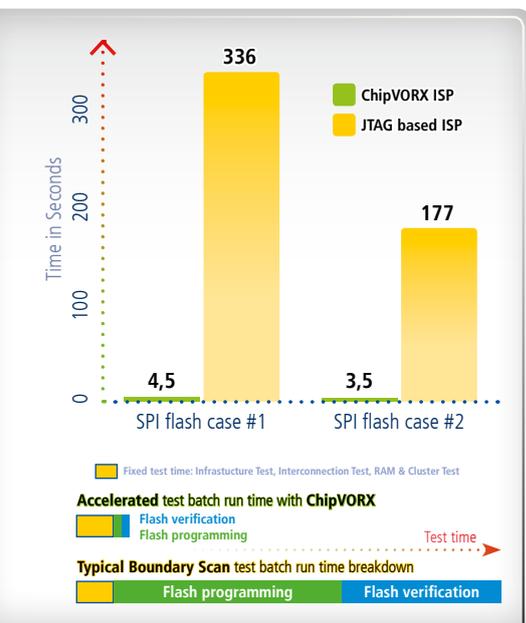
ChipVORX enables ultra-speed flash programming

Embedded System Access (ESA) via ChipVORX

Continuously dwindling test access, paired with high-speed signals, increasingly complicate the test of modern boards. Latest technologies for Embedded System Access offer completely new solutions to solve this problem.

While IEEE 1149.1 (JTAG/Boundary Scan) has been around for more than 20 years and is widely used today, Chip-embedded Instrumentation is getting increasing attention from board and system designers and test engineers. These instruments are essentially chip-integrated test and measurement IP, which is controlled through a JTAG interface. Access to such Chip-embedded Instruments is currently being standardised as IEEE P1687 (IJTAG). ChipVORX is the world's first system technology that allows a true fusion of Boundary Scan, Chip-embedded Instrumentation, and other ESA technologies on one system platform.

Utilisation of Chip-embedded Instruments

The ChipVORX architecture is open, just like the functionality of the instruments. Possible applications include:

- Control of IEEE 1687 (IJTAG) accessible instruments
- Control of IEEE 1149.1 accessible instruments
- Control of proprietary instruments
- Control of configurable instruments in FPGA devices
- Interactive tests with Boundary Scan operations

Information and results generated by the instruments can be processed automatically by the test program (compiler mode) or can be visualised interactively (debug mode). SYSTEM CASCON provides various graphical tools for debugging purposes.

FPGA based Test and Measurement Applications

FPGA embedded instruments promote particularly interesting technologies, such as FPGA Assisted Test (FAT) and FPGA Assisted Programming (FAP). ChipVORX already supports a multitude of functions and provides respective soft-macros, which can be used without further synthesis. These functions include:

- Universal frequency measurement/event counter
- At-speed RAM access test (DDR2/3/4)
- Bit Error Rate Test (BERT)
- Flash programming (NAND/NOR,SPI,I2C)

For many of these functions automatic test program generators are available. The efficiency of ChipVORX applications is significantly higher compared to some Boundary Scan for certain applications such as flash programming. ChipVORX supports all FPGA families from Altera, Lattice and Xilinx. Latest information about ChipVORX models can be found at **goepel.com/chipvorx**.

Get the total Coverage!

ISO 9001 certified