System Software

JTAG/Boundary Scan

GÖPEL electronic

Get the total Coverage!
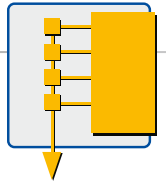
The Software Concept

The key to successful implementation of IEEE 1149 standards is the **quality** and **performance** of the software.

GOEPEL electronic recognised this fact early on and was the first vendor to introduce the concept of an integrated software platform with a comprehensive tool suite for automatic test program generation back in 1991. Today, the **SYSTEM CASCON** architecture is available in its fourth generation and is utilised on a global scale.

Our **development strategy** is to secure investments already made by continuous **updates** and **upgrades**.

The main **features of our software concept** are:

- a fully integrated software platform
- graphic project development with Mission Assist™
- maximum productivity due to intelligent tools
- maximum safety for the test vectors
- extended test depth for non-scannable circuitry
- combination of state-of-the-art test and programming strategies
- deep interaction and integration capability for other ATEs
- maximum modularity and scalability
- personalisation of the entire system (myCASCON)
- support during the entire product life cycle
- a portfolio containing more than 100 software tools and editions

Multi-dimensional Scalability

Owing to its **open scalability**, SYSTEM CASCON offers special **flexibility**. As a rule, seven parameters are defined. This principle enables the **use** of software throughout the **entire product life cycle** as well as user-friendly update or upgrade options.

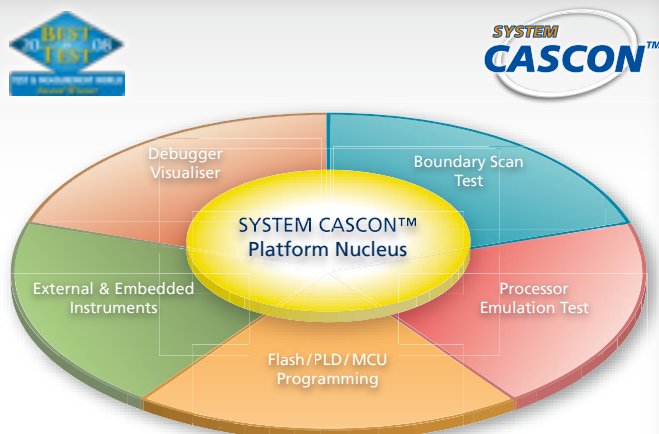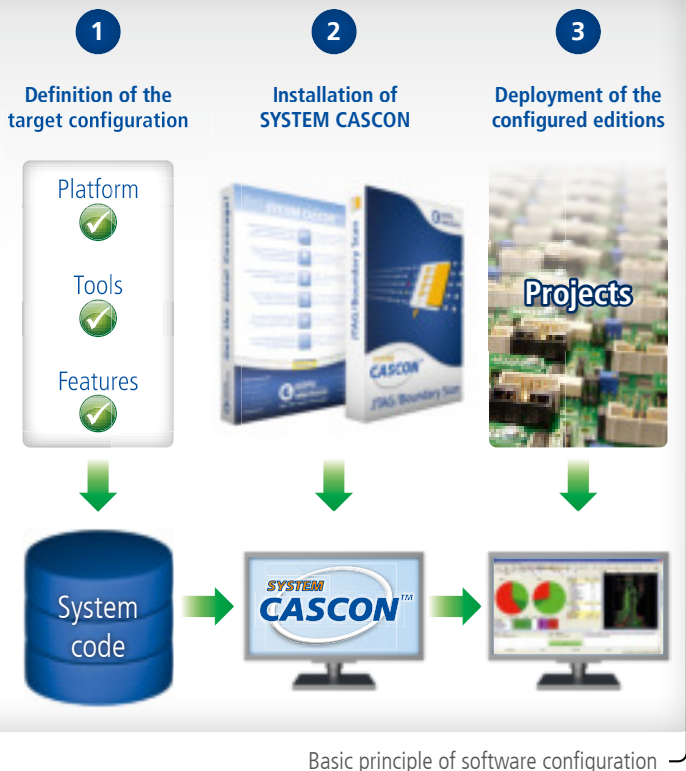| Parameters	Available licensing options
Platform	Development system (DS) / production system (PS)
Tools	Type and number* of each individual tool
Time base	Perpetual licensing / Limited term licensing
Licensing	Node locked (NL) / floating (FL): Site/WAN/GAN
IP models	Type and number* of each individual tool
Features	Individual selection of certain specific functions
Projects	Number of possible projects (pay per project)

*Multiple licensing for multi-user operation with floating license

Pre-configured editions with cascading performance are available for the effective definition of target software, e.g. the CASCON GALAXY development systems.

Tool suite/module level	Base	Standard	Classic	Advanced
Processor Emulation Test	☆	☆	☆	★★★
Device programming	☆	★★	★★★	★★★
Boundary Scan test	★	★★	★★★	★★★
Functional I/O test	★	★★	★★	★★★
Integrated instuments	★	★	★★	★★★
Debugger/visualiser	★	★	★★	★★★
CASCON platform module	★★★	★★★	★★★	★★★

☆ optional   ★ good   ★★ very good   ★★★ excellent

In addition, a range of **other packages** is available specifically for **production** purposes as well as solely for **programming**.

1 Definition of the target configuration
2 Installation of SYSTEM CASCON
3 Deployment of the configured editions

Platform ✓
Tools ✓
Features ✓

System code

SYSTEM CASCON™

Projects

Basic principle of software configuration

SYSTEM CASCON™ Platform Nucleus

Debugger Visualiser
Boundary Scan Test
External & Embedded Instruments
Processor Emulation Test
Flash / PLD / MCU Programming

IEEE 1149.1 • IEEE 1149.4 • IEEE 1149.6 • IEEE 1532 • JESD71 • IEEE 1445 • IEEE 1450

SYSTEM CASCON software platform

Further **packages** and **detailed information** are available at
goepel.com/en/system-cascon

Always the Right Tools

It's the Platform that Makes the Difference

In principle, the CASCON platform amounts to an extended **Boundary Scan operating system** with appropriate plug-in tools.
Key elements of special importance are:

- central project management
- a central programming language (CASLAN)
- open interfaces for data and system control

These factors are crucial for ensuring the performance, flexibility, openness and future operability of the system.

Tool Suite: Boundary Scan Test

This comprehensive suite contains powerful **ATPG tools** (automatic test program generation) that generate de-buggable CASLAN source code and can also integrate external I/O channels. The PFD modules (pin failure diagnostics) ensure clear error messages.

BST process	ATPG	PFD	CASLAN	AGB*	Ext. I/O
Manual scripting	-	✓	✓	-	✓
Infrastructure	✓	✓	✓	✓	-
Connection (1149.1)	✓	✓	✓	✓	✓
Connection (1149.6)	✓	✓	✓	✓	✓
Memory cluster	✓	✓	✓	-	-
Logic cluster (truth table)	✓	✓	✓	-	✓
Logic cluster (waveforms)	✓	✓	✓	-	✓
Virtual Scan Pin probe	✓	✓	✓	✓	✓

***AGB**: Anti Ground Bounce

Tool Suite: Device Programming

Regardless of whether **complex flashes** or **PLDs** are being used, this suite always offers the ideal tool for automated, fast and secure **programming**, for each application.

Programming tool	MCU	PLD	serial flash	parallel flash
Core-assisted Programming[1]	★★★	★★★	★★★	★★★
IEEE 1149.1/Boundary Scan	★	★	★	★★
JAM/STAPL/SVF/IEEE 1532	★	★★★	★	★
FPGA-embedded Programmer[2]	★	★	★★★	★★★
External PIO channels	★	★	★★★	★★★

[1]VarioTAP   [2]ChipVORX   ★ good   ★★ very good   ★★★ excellent

Tool Suite: Debugger/Visualizer

This suite enables **graphical analysis** and **validation** of designs and project data during full cross-probing.

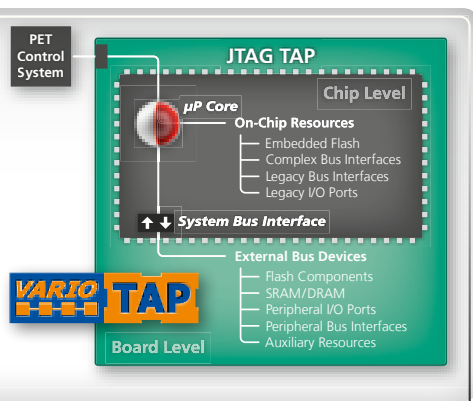| Tool domain	Tool suite
Hardware debugger	Pin Toggler, Logic Analyzer, Watch, Break Points, Interactive CASLAN Execution, Vector Browser
Software debugger	Interpretive CASLAN Execution, Watch, Breakpoints
Visualiser	Schematics, Virtual Schematics, Board, Multiboard
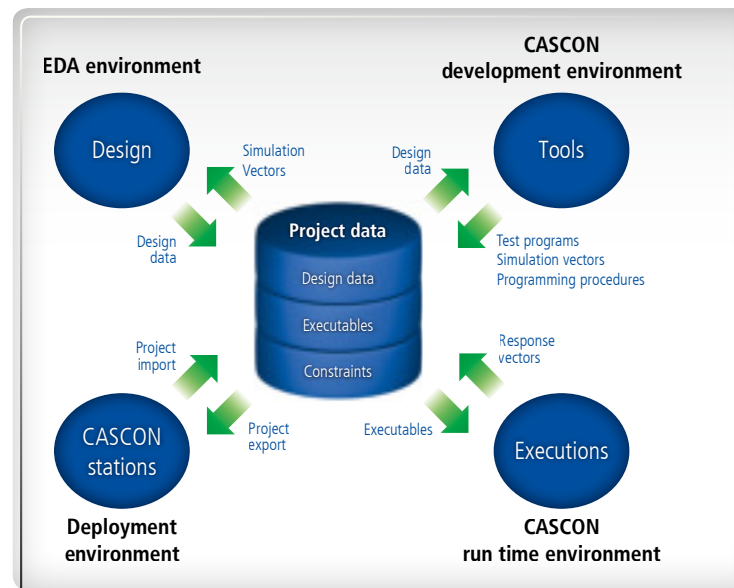
Projects ensure consistent data management

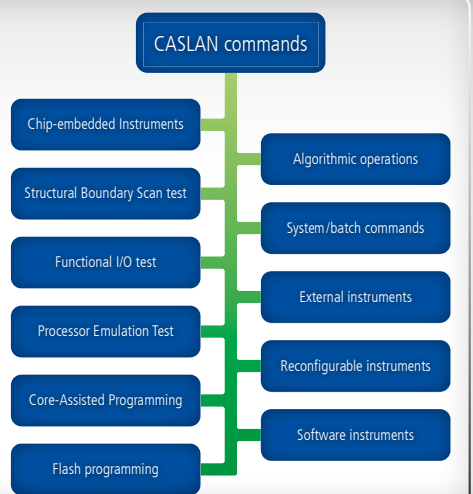SYSTEM CASCON: Intuitive user guidance through Mission Assist™

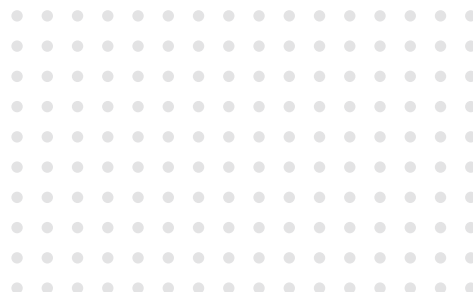Debugger and graphical test coverage analysis

PET
Control
System

JTAG TAP

µP Core

Chip Level

On-Chip Resources
— Embedded Flash
— Complex Bus Interfaces
— Legacy Bus Interfaces
— Legacy I/O Ports

↑ ↓ System Bus Interface

VARIO TAP

External Bus Devices
— Flash Components
— SRAM/DRAM
— Peripheral I/O Ports
— Peripheral Bus Interfaces
— Auxiliary Resources

Board Level

Transition of the native micro processor to a design-integrated test controller

Tool Suite: Processor Emulation Test (PET)

VarioTAP by GOEPEL electronic is revolutionary – the world's only technology for the **fusion** of **Boundary Scan** and **Processor Emulation Test**. This comprehensive suite bridges the gap towards achieving higher testing dynamics and also enables synchronisation with external I/O channels.

PET procedure	ATPG	PFD	CASLAN	Binary IP	External I/O	Speed
Manual scripting	-	✓	✓	-	✓	at-speed
Memory cluster	✓	✓	✓	-	-	real time
Bus components	✓	✓	✓	-	✓	at-speed
Peripheral interface	-	✓	✓	-	✓	real time
Code runner	-	-	-	✓	-	real time

✓ partly accurate   ✓ totally accurate

Tool Suite: for Integrated Instruments

Chip-embedded instruments can prevent the problems with access points prevalent in traditional external instruments, while SYSTEM CASCON – by virtue of ChipVORX® technology and open software interfaces – is able to simultaneously access and control both classes. This ability greatly **improves** the **capacity** and **test coverage** of the entire system.

Type of instrumentation	Controllable instruments
Chip-embedded Instruments	Softcore IP (FPGA based), hardcore IP
External ATE instruments	Software instruments, hardware instruments, VarioCore instuments*

*VarioCore is a proprietary technology for the reconfiguration of I/O modules

Tool Suite: for Functional I/O Test

In addition to structural tests, SYSTEM CASCON also offers **tools for functional testing**. Here, too, CASLAN multipurpose control language is a key feature. To generate tests, one can either import simulation vectors in IEEE 1445 format, or resort to behavior models in the CASCON library. Selected PXI or SCANFLEX modules by GOEPEL electronic, which can generate the vectors dynamically, can be used as external I/O drivers.

I/O level	ATPG	PFD	CASLAN	IEEE 1445	I/O driver	Speed
Board I/O	✓	✓	✓	✓	External I/O	at-speed
Cluster I/O	✓	✓	✓	✓	Boundary Scan	real time
Device I/O	✓	✓	✓	✓	Boundary Scan	at-speed

Hardware Support

With **SCANFLEX**, **SCANBOOSTER** and **CION** modules, GOEPEL electronic offers a portfolio of more than 450 hardware products that are optimally adapted to the architecture of SYSTEM CASCON. Third-party instruments and serial TAP I/O modules can be easily integrated.

CASLAN commands

Chip-embedded Instruments

Structural Boundary Scan test

Functional I/O test

Processor Emulation Test

Core-Assisted Programming

Flash programming

Algorithmic operations

System/batch commands

External instruments

Reconfigurable instruments

Software instruments

CASLAN controls and synchronises all system operations

ℹ More **detailed information** and **datasheets** are available at

goepel.com/en/esa/hardware

GOEPEL electronic

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