Hardware Components

JTAG/Boundary Scan

GOEPEL electronic

Get the total Coverage!

Geared Towards Perfection

The Hardware Concept

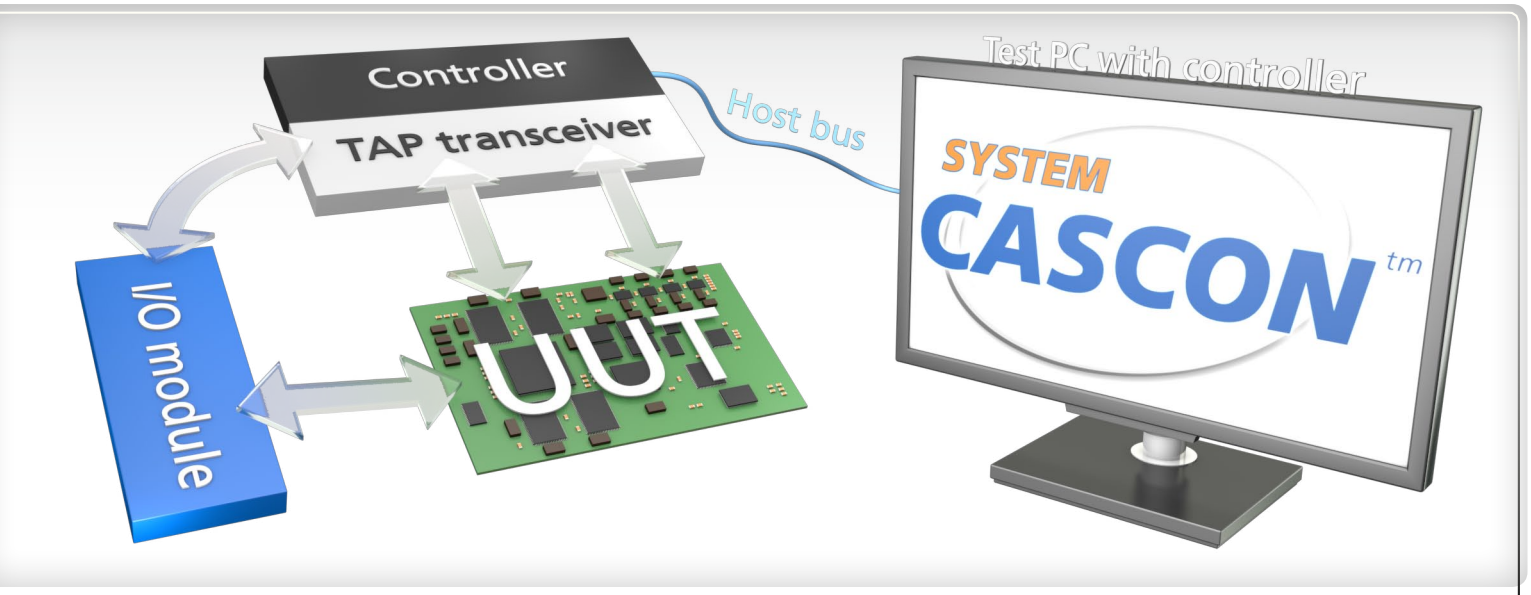
An appropriate and **high-performance hardware platform** is necessary to make full use of the **possibilities provided by JTAG/Boundary Scan** technology and the numerous new IEEE 1149.x standards.

Dedicated to meeting this challenge since 1991, GOEPEL electronic has the broadest and most powerful range of products currently available in the world – in the form of the **PicoTAP** and **SCANBOOSTER** controller families, as well as the **SCANFLEX** system platform.

At the same time, our **development strategy** focuses especially on securing investments already made by providing **updates** and **upgrades**.

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

- fully parallel TAP architecture
- leading performance through hardware acceleration
- software-defined TAP protocols
- signal interfaces adapted to production demands
- support of substantial distances to the unit under test
- maximum fault coverage due to supplementary reserves
- optimal integration capability into another ATE
- maximum modularity and scalability
- in-field hardware updates
- support of all important bus platforms
- a portfolio consisting of more than 450 hardware components



Basic principle of the interaction between **controller**, **I/O module**, **TAP transceiver** and **unit under test** (UUT)

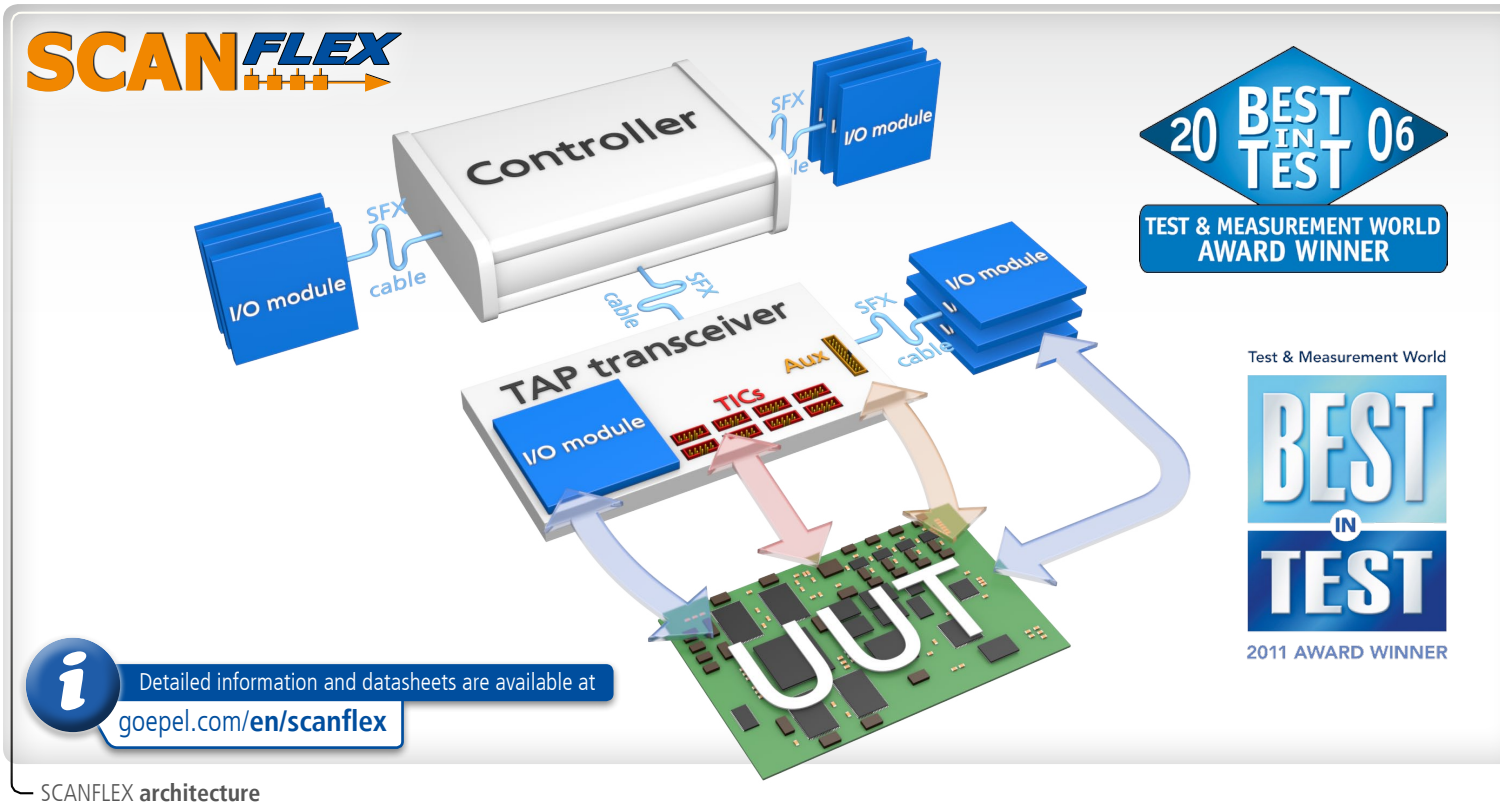
Available **controllers** and **application targets**

Always the Right Choice

	Platform	PicoTAP	SCANBOOSTER	SCANFLEX
Controller	Bus interfaces	USB 2.0	USB 2.0 / PCI/PCIe / Cabled PCIe	USB 2.0 / PCI/PCIe / Cabled PCIe / PXI/PXIe / Gigabit Ethernet / Firewire
	TCK (max.)	10 MHz	16 MHz	80 MHz
	Software-scalable performance	-	-	✓
	High-speed scan architecture	-	-	SPACE
TAP transceivers	Support of SCANFLEX TAP transceivers	-	-	✓
	TAPs (max.)	1	2	8
	Interchangeable TICs	-	✓	✓
	Programmable TAP parameters	-	input and output voltage impedance	input and output voltage / impedance / TDO delay
	TAP I/O voltages	3.3 V	1.8 – 4.5 V	1.8 – 4.5 V
	Additional resources	-	ADC / DAC / 32 PIO / trigger	analog / digital / mixed / bus interfaces / dynamic I/Os
	Gang support	-	-	up to 16 UUTs in parallel
I/O modules	Support of SCANFLEX I/O modules	-	-	✓
	Docking of I/O modules	serial	serial	serial / parallel
	Selectable module types	CION Module	CION Module	SCANFLEX modules / PXI modules / CION Module
	max. number of modules that can be docked	approx. 10	approx. 10	SCANFLEX: approx. 30 / CION Module: approx. 10
	Slots for plug-in modules	-	-	SFX-TAP2/4/6: **1** x SFX-TAP7: **3** x SFX-TAP8: **2** / **3** x SFX-COMBO 1149: **3** x SFX-Carrier: **5** / **10** / **15** x
Applicationen	Use during the product life cycle	laboratory	laboratory / production (low volume)	all stages of the product life
	Performance of flash programming	low	moderate	high-speed
	Performance of PLD programming	low	moderate	high-speed
	Performance of test execution	low	moderate	high-speed
	Supported technologies	ChipVORX (limited)	ChipVORX (limited)	VarioCore / VarioTAP / ChipVORX
	max. distance to the unit under test	less than 1 m	up to 4 m (with additional hardware)	up to 4 m (with additional hardware)
	OEM integration into third-party ATE	-	✓	✓

✓ partly true ✓ entirely true

SCANFLEX® – A Revolutionary Solution



SCANFLEX **architecture**

The SCANFLEX® Hardware Platform

Our prize-winning SCANFLEX hardware was the first **fully modular** JTAG/Boundary Scan **platform** on the market and is still the **most modern system architecture** available to date. It consists essentially of three components: controllers, TAP transceivers and I/O modules.

The Controllers …

… are available in three performance classes and can be configured through software.

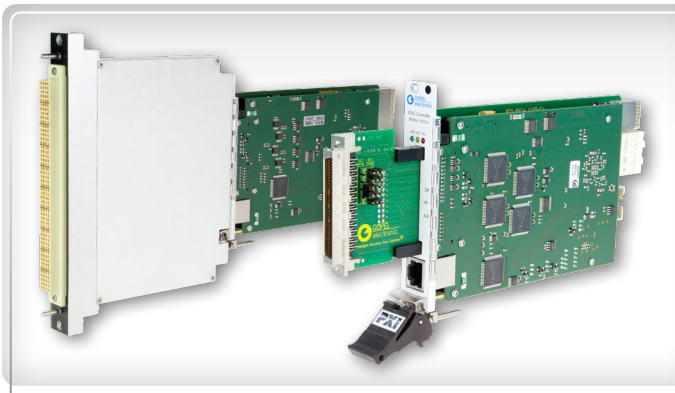
Controller	A controller	B controller	C controller
TCK (max.)	20 MHz	50 MHz	80 MHz
Vector processing	Data Buffering	SPACE II	SPACE II-S

The TAP Transceivers …

… are the front end facing the unit under test, while controllers are the back end. They are available in various form factors to address even the most diverse application environments.

TAP transceivers	Desktop	Compact	Gang	OEM
Form factor	box	industrial	rack	ATE slot
Additional resources	✓	✓	✓	✓
Cut-off relays	-	(✓)	(✓)	✓
TIC/TEM assembly	slots	fixed	slots	fixed
I/O module slots	1 – 3	(1)	6	(1)

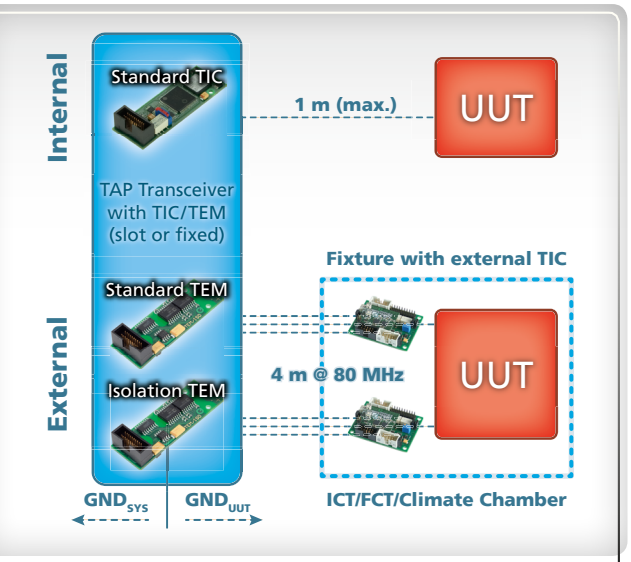
(✓) partly true ✓ entirely true



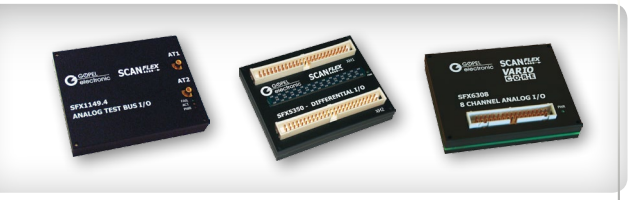
Various SCANFLEX **controllers**

SCANFLEX **TAP transceiver**

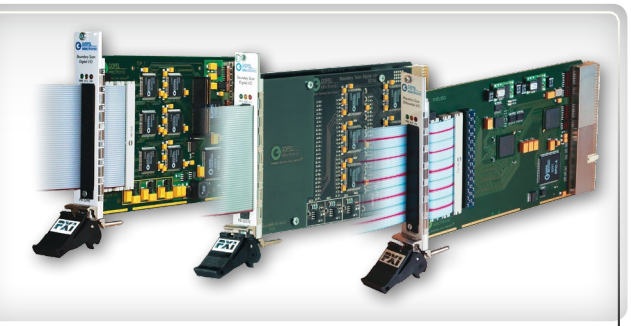
SCANFLEX® and SYSTEM CASCON™



Plugging **TAP Interface Cards** (TICs)



SCANFLEX **I/O modules**



PXI I/O modules

SYSTEM CASCON™

SYSTEM CASCON

Adaptable TAP transceivers …

… are particularly flexible due to „**TAP Interface Cards**" (TICs), which can be plugged either internally or externally. External plugging requires TIC Extension Modules (TEMs). We are continuously expanding our TIC portfolio and ensure that all types, being equipped with slots, can be freely combined. TAP transceivers typically come in two product versions and with permanently installed TICs and TEMs.

TAP Interface Cards	Standard TIC	In-fixture TIC
Form factor	TIC slot size	not defined
Distance to UUT	< 1 m	< 4 m
Integration	internal	externally via TEM
Galvanically insulated	-	optional

I/O modules …

… are the third element of the SCANFLEX principle. A broad range of independently selectable modules with numerous test functions (analog/digital/mixed signal) is available. At the same time, in many modules the VarioCore technology ensures dynamic re-configurability of the active test functions on the basis of software-defined intellectual property (IP).

… as PXI modules

PXI is one of the most important integration platforms for current test systems. To supplement the SCANFLEX controllers, a range of digital I/O modules are available: these modules make it possible to combine JTAG/Boundary Scan technology with functional tests for single-ended and differential-ended I/Os. Moreover, the I/O channels can be easily integrated into the Boundary Scan test procedures (e.g. interconnection test). The range of I/O modules comprises pure software-driven I/O modules as well as modules for dynamic functional testing of up to 100 MHz and Mbit memory behind the pin.

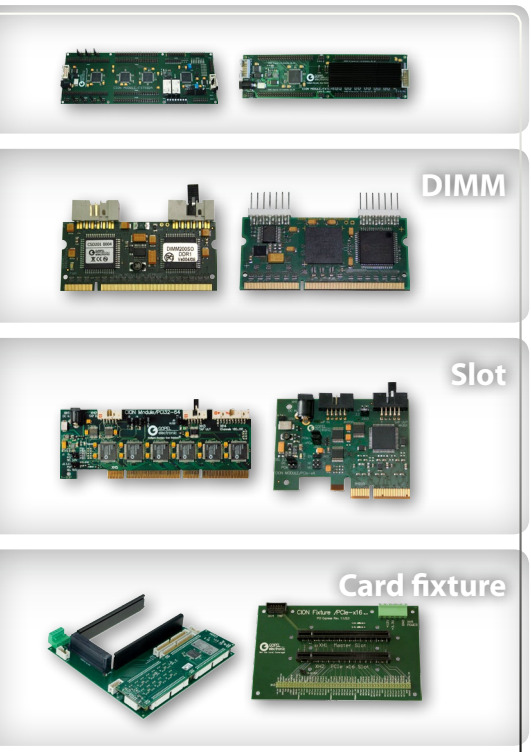
Detailed information and datasheets are available at
goepel.com/**en/pxi-io-modules**

Software Support

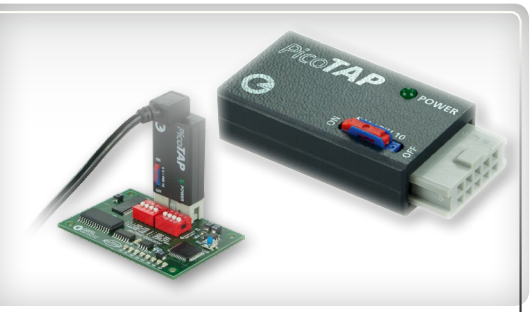
All **hardware products** are fully **supported by** the **SYSTEM CASCON** JTAG/Boundary Scan platform. At the same time, **test programs** are in principle **cross-compatible** between the controllers. SYSTEM CASCON, developed by GOEPEL electronic, is an integrated development and execution platform that can be used throughout the entire product life cycle.

Detailed information and datasheets are available at
goepel.com/**en/software**

CION Modules™, PicoTAP and SCANBOOSTER™



CION Modules



PicoTAP

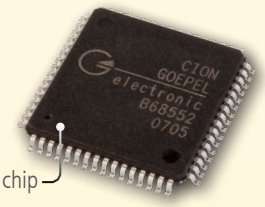
SCANBOOSTER

CION Modules™

CION Modules are based on the **CION™** interface chip, also developed by GOEPEL electronic, and can be serially accessed and controlled through a TAP. They are **external** boundary scan **extensions of the units under test** and can be used to test peripheral I/Os, connectors, backplanes, bases, etc. **Several modules** of the same or different size can **easily** be **cascaded** to increase the number of channels. Currently, we are offering CION Modules in four different versions.

CION Modules	Standard	DIMM	Slot	Card fixture
Test object	universal	DIMM socket	plug-in cards	plug-in cards
Interface	up to 227 I/O	DDR1/2/3	PCI/PCIe	PCI/PCIe/ATCA
I/O type	analog/digital relays/opto	digital	digital	digital
IEEE 1149.x	1149.1 / 1149.6	1149.1	1149.1 / 1149.6	1149.1 / 1149.6

Detailed information and datasheets are available at
goepel.com/**en/cion-module**



CION™ chip

PicoTAP and SCANBOOSTER™

Several controllers with a moderate capacity are available as part of the PicoTAP and SCANBOOSTER range and are aimed specifically at **cost-sensitive** or **uncritical applications**. **PicoTAP** is an **extremely small controller** with a USB interface and a pre-installed TAP header. The controllers of the **SCANBOOSTER** series, on the other hand, come equipped with two independent TAPs, feature a number of additional resources and can be **flexibly** configured **for the most varied applications** using TICs (see SCANFLEX), which are identical to the TIC slots on the SCANFLEX platform.

Controller family	PicoTAP	SCANBOOSTER
TIC/TEM assembly	-	slots
Additional resources	-	✓
Programmable TAP voltage	3.3 V	1.8 – 4.5 V

Detailed information and datasheets are available at
goepel.com/**en/picotap**

GOEPEL electronic

Get the total Coverage!

ISO 9001 certified

GOEPEL electronic GmbH
Goeschwitzer Straße 58 / 60
07745 Jena / Germany
Phone: +49 (0) - 3641 - 6896 - 0
Fax: +49 (0) - 3641 - 6896 - 944
E-Mail: sales@goepel.com
Internet: www.goepel.com

Authorised Distributor:

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sales@goepel.co.uk sales@goepelusa.com sales@goepel.asia sales@goepel.fr