

MAKING YOUR FUNCTIONAL TEST SYSTEM JTAG-AWARE

Adding JTAG to your tester

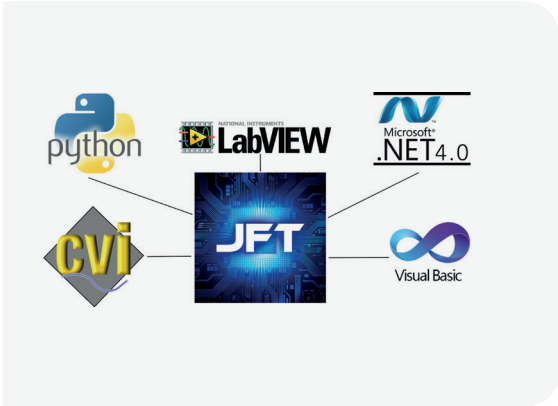
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Benefits

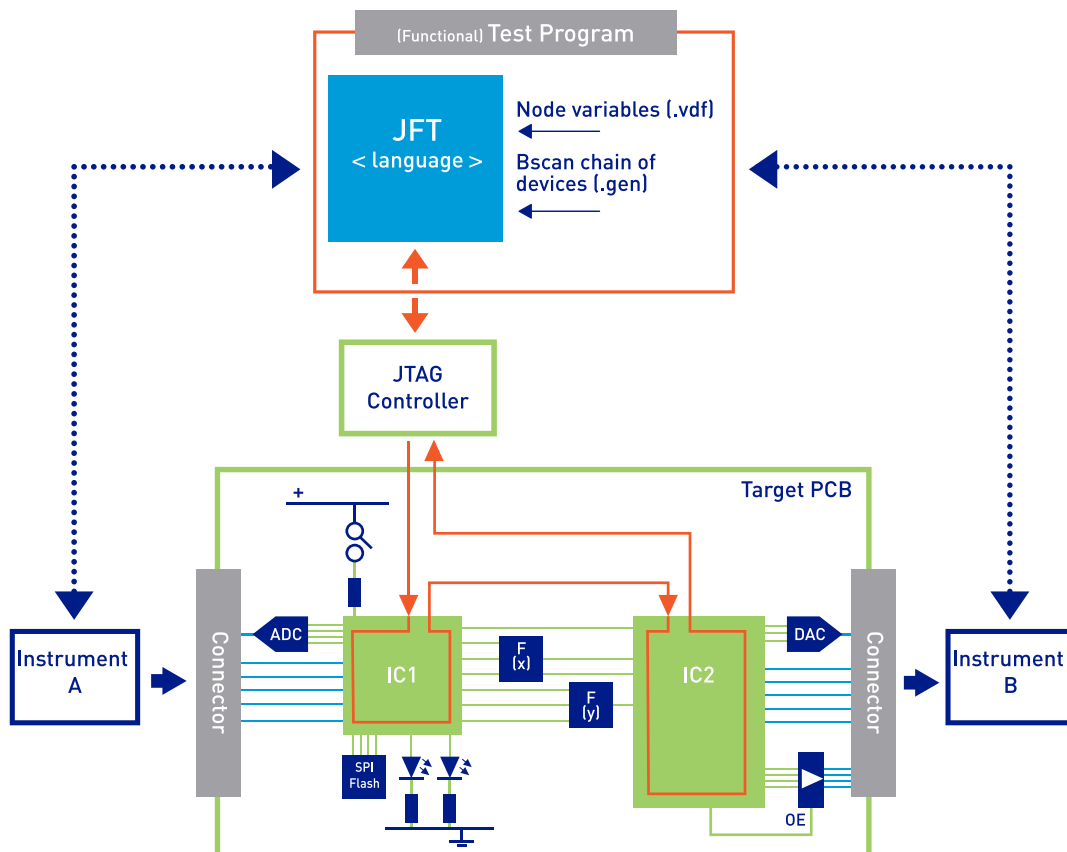
JTAG Functional Test Benefits

- Enhances your functional test (FT) strategy with JTAG/Boundary-scan
- Shortens production repair times and reduce repair costs
- Improves diagnostic capabilities
- Promotes firmware independent testing
- Improves overall board test fault coverage
- Works with low-cost JTAG interface hardware
- Supported by popular FT programming environments
- No need for operators to learn a new (graphical) user interface



Functional test systems typically use edge connector access to stimulate and monitor a PCB or system. To simplify the tests and to facilitate detailed diagnostics it is often necessary to control and observe the state of internal nodes on the PCB. Controlling or observing individual nodes via the edge connectors often proves to be very challenging if not impossible and special test points are then added to the board to give access to such internal nodes.

JTAG devices on your board already have “virtual” test points built-in. Through the JTAG interface you can directly control and observe these test points. By making your functional test system “JTAG aware” you can use these capabilities on your target board and substantially simplify your tests and enhance their diagnostic capabilities.



Making your Functional test JTAG-aware

Your functional test system is made JTAG aware through the addition of a JTAG controller. This controller provides the hardware interface between your control computer (PC) and the JTAG interface on your target board(s). In addition to the controller, software is needed to control and observe the JTAG test points on your board. JFT (JTAG Functional Test) provides these capabilities.

Initially developed to run on one of the world's most popular interpreted programming languages, (Python 3.x). JFT is now also supported by other industry standard test developments systems such as National Instruments' LabVIEW and Microsoft .NET.

With the ability to drive and sense both individual pins and groups of pins, and by harnessing the flow control of a high-level language, users can create more sophisticated tests for devices or functions comprising groups of devices. JFT can be used for simple applications such as driving LED's, reading positions of switches, enabling a buffer or checking if the connection between 2 boundary-scan pins is present, etc.. JFT can also be used for example to simplify testing of mixed signal parts such as ADCs and DACs, communicating over I2C or SPI and testing parts that require user intervention, looping test patterns to set-up device registers etc..

Test from inside the device core

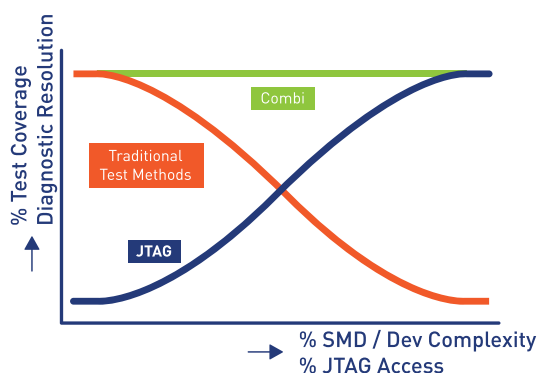
JFT capabilities can be further enhanced by adding 'CoreCommander' options for microprocessors and also FPGAs. CoreCommander uses the JTAG interface to communicate to the processor's debug logic (e.g. ARM, Infi- neon, NXP/ Freescale, X-Scale.. etc.). Using CoreCommander options users can write/read to memory space within a compliant device and access internal IP blocks such as memory controllers (DDRx), ADCs & DACs, Timer/Counters, or other systems such as high-speed bus interfaces.

Chain information

JFT requires information about the boundary-scan chain(s) infrastructure on the target board. The data includes accessible boundary-scan device types, their position in the chain, supported boundary-scan (IEEE 1149) instructions and the input/output (IO) capability for each pin. This information is provided by two files that are automatically generated by JTAG ProVision or by the free JTAGLive Buzz product.

Seamless Integration

JTAG control and observation of pins and nets should also be possible in combination with the control of other test and measurement instruments connected to the edge connectors. To support this JFT allows for a seamless integration of JTAG functions in a wide variety of existing environments on the factory floor. Microsoft C/C++, Microsoft .NET assemblies, Visual Basic, and National Instruments' LabVIEW and LabWindows/CVI are all supported through individual JFT packages comprising various functions to drive and sense nodes on the target. JFT can also be used in combination with In Circuit Testers.



Effect of adding JTAG

Increase coverage

The increasing complexity of devices used on boards – eg. System on Chips (SoCs) - causes a drop in coverage and reduced diagnostics capabilities of existing test systems. By adding JFT to a test system its test coverage and failure localization capabilities are greatly improved for boards containing one or more JTAG compatible devices. The addition of JTAG Functional Tests helps to shorten the repair times in the factory and decrease the repair costs for such boards.

License

A JFT license comes with a Sentinel USB key and associated license file. The license is valid permanently and is independent of the project at hand. This guarantees your JFT license to be available at all times and for all products that need testing. If your PC has a defect, the JTAG Technologies JFT key can be connected to another PC and you can continue your production activities. A permanent license also guarantees that production is not interrupted due to missing an unforeseen license ending date. A JFT license supports all controllers from JTAG Technologies. You can thus swap controller types easily without facing licensing issues.

Function Categories and examples

Initialize

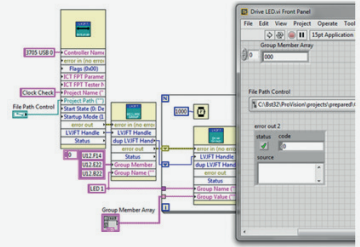
- Jft_Initialize
- Jft_SetTapsetVoltage
- Jft_SetScanFrequency
- Jft_Close

Execution

- jft_DriveHigh
- jft_DriveLow
- jft_TestHigh
- jft_TestLow
- jft_DriveGroup
- jft_TestGroup
- jft_GetGroup
- jft_DriveVar
- jft_GetVar
- jft_HighZ

Chain

- Jft_GetDataRegisterID
- Jft_GetDeviceInstruction
- Jft_GetDeviceList
- Jft_Get_CurrentConfig
- Jft_GetDataRegisterLength



Example of a JFT LabVIEW program where the JFT functions are used to check a RGB LED on the target

Order numbers	
JFT/DLL	Microsoft C/C++ Dynamic Link Libraries
JFT/LV	National Instruments LabVIEW instrument drivers
JFT/LW	National Instruments LabWindows/CVI instrument drivers
JFT/.NET	Microsoft .NET Assemblies (C#, VB .NET)
JFT/VB	Module files for Visual Basic 6

Related products and brochures	
ProVision	JTAG automatic application development
JTAGLive	JTAG application development
CoreCommander	Use JTAG debug registers and access of microcontrollers
Controllers	JTAG controllers
I/O	Digital and Mixed-Signal I/O modules

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• China, Malaysia, Singapore, Thailand, Taiwan	+86 (021) 5831 1577	info@jtag.com.cn
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JTAG
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We *are* boundary-scan.®