

ScanExpress JET™

JTAG-based At-Speed, Non-Intrusive Functional Testing
Ideal for Autonomous Vehicle Systems.



Revolutionize the way you think about test

JTAG Functional Test for Autonomous Vehicle Processor Modules

Autonomous vehicle systems have led to an increasing proliferation of processor-based printed circuit board assemblies (PCBAs)—in an industry where assembly quality is a primary concern and rapid and agile production is essential. Testing those systems to verify quality is a challenge: most functional tests need to be customized for each design, limiting reusability and increasing engineering effort.

Traditionally, software developers create test code, reducing available engineering time for product development. Even when functional tests become available, the diagnostic details are often inadequate to give clear visibility on a given problem.

ScanExpress JET is a tool designed to overcome these challenges by automating the functional test generation process on CPU-based IEEE-1149.1 (JTAG) compliant circuit boards. Coined JTAG Embedded Test, **JET** is the preferred method for at-speed, non-intrusive functional testing.

ScanExpress JET Automotive Applications

Infotainment

ScanExpress JET can be used to test RAM, flash, and interface peripheral components in information and entertainment systems immediately after manufacture—before boot and application code has been developed.

ADAS

The processing systems behind Advanced Driver Assistance Systems (ADAS) technologies often employ system-on-chip (SoC) devices, devices that JET can use to test the system for manufacturing defects on a wide variety of electronic interfaces.

Telematics

Interfaces between the CPU and PHY components in Telematics control units can be tested with custom scripts to verify functionality—no operating system required.

Embedded Systems

By combining ScanExpress JET with Corelis boundary-scan tools, test coverage for any embedded system can be expanded. Best of all, the same hardware and software interface can be used, allowing JET and boundary-scan tests to be executed at a single test station—or integrated into existing automated test systems.

Product Features

- Enhanced testing of CPU-based electronic modules using the JTAG debug/emulation port
- CPU-assisted, at-speed test routines are downloaded via JTAG into CPU cache memory or external RAM for optimal performance
- JTAG embedded tests can be combined with boundary-scan structural tests for extended test coverage
- Automatic generation of functional tests for common RAM and flash, including in-system-programming
- "C"-style command script language with single-step capability for custom test sequences
- Extended coverage beyond boundary-scan for all CPU-accessible resources
- Large, ever-expanding library of supported processors
- Automatically constructs test plans for integration into the ScanExpress Runner™ test execution sequencer (sold separately)
- Support for multiple CPU architectures using the same software and hardware interface

Benefits

- Improves module test coverage and fault diagnostics
- Dramatically reduces the time it takes to develop functional tests for CPU-based automotive systems
- Reduces ICT usage and related fixture costs
- Programs devices in-system up to theoretical CPU speeds
- Helps identify why system modules don't boot
- Enables test coverage on electronic components with limited physical access

Learn More: For more information about Corelis products, please visit www.corelis.com

ScanExpress JET automates at-speed functional test development for embedded system peripheral components that interface with an IEEE-1149.1 compatible CPU. Because it is non-intrusive, ScanExpress JET tests can be used to verify electronic assembly of automotive system modules without modifying the PCB circuitry or the on-board firmware, and may even be combined with traditional Corelis boundary-scan tests steps in a single test sequence.

The JET development system can be used across multiple CPU platforms using a built-in peripheral component library. Tests for standard components are automatically created, while the powerful diagnostic script engine provides test engineers with a platform for interacting with system registers as well as loading and executing embedded code. The JET script engine operates over a processor JTAG port to provide users simplified access to the following operations:

- Run, Stop, and Step Functions
- Write to Registers & Memory
- Read from Registers & Memory
- Exchange Parameters with the JTAG Host
- Display CPU Status

The host software automatically uses these features to download test & diagnostic routines into the CPU cache or external memory. These routines then execute at full processor speed and report results back to the host system.

Simple Connection to a Unit-Under-Test (UUT)

JET requires a UUT with a JTAG-enabled processor and external access to its Test Access Port (TAP). A Corelis high-speed JTAG controller serves as the interface between the PC and the TAP interface.

System boards typically include a single JTAG TAP connector dedicated to each CPU. This TAP is often used for JTAG-based software debug and can be leveraged for additional tests with ScanExpress JET. Boards may also include additional JTAG TAP connectors for boundary-scan test and in-system programming.

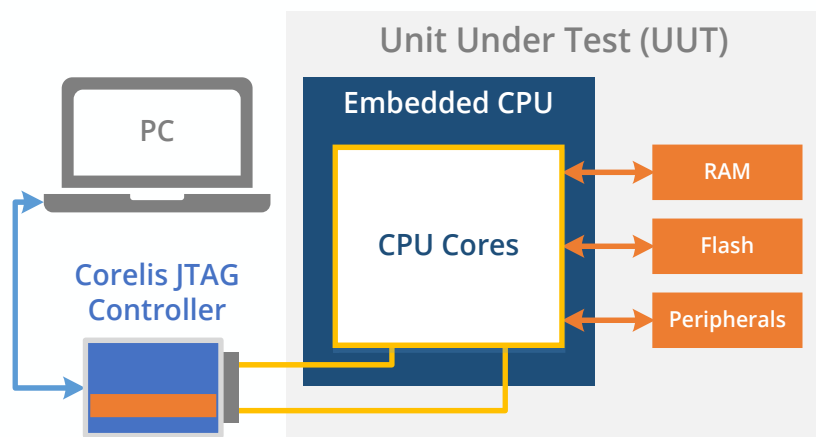


Diagram of ScanExpress JET Test System for a Typical Automotive PCBA

The figure above depicts a Corelis single-TAP JTAG controller connected to a board with an embedded CPU, enabling at-speed functional testing of RAM, flash, and other interface peripherals. The ScanExpress JET system is also able to handle cases where more than one JTAG-compliant device is connected in a single scan chain, as well as systems with multiple TAP connections.

Ordering Information

Part Number - 20700

ScanExpress JET Test Development System supporting both Test Program Generation and Execution.

Part Number - 207XX

CPU-specific support package for ScanExpress JET. Contact Corelis for a list of supported processors and part numbers.

Note: At least one CPU support package must be purchased with the ScanExpress JET Test Development System.

For more information about this product, view the ScanExpress JET whitepaper on our website:

<http://www.corelis.com/whitepapers/>

Supported Automotive Processors

NVIDIA TEGRA K1

NXP i.MX6

NXP MPC56xx

Mobileye EyeQ3
(STM32)

Cyclone V SoC
(Automotive)

Many More!