# Quick Path from Fault Detection to Repair
with QUICK INSTRUMENTS

QUICK INSTRUMENTS is a groundbreaking technology and an automated solution that provides functional test extension driven by test coverage and troubleshooting requirements. The technology is tailored especially for digital electronic assemblies and high-speed interfaces.

QUICK INSTRUMENTS populate existing on-board FPGAs converting them temporarily into a fully-automated on-board embedded tester. No extra FPGA/DFT is needed - the existing device is used. What is more, FPGA design tools or expertise is not required too.
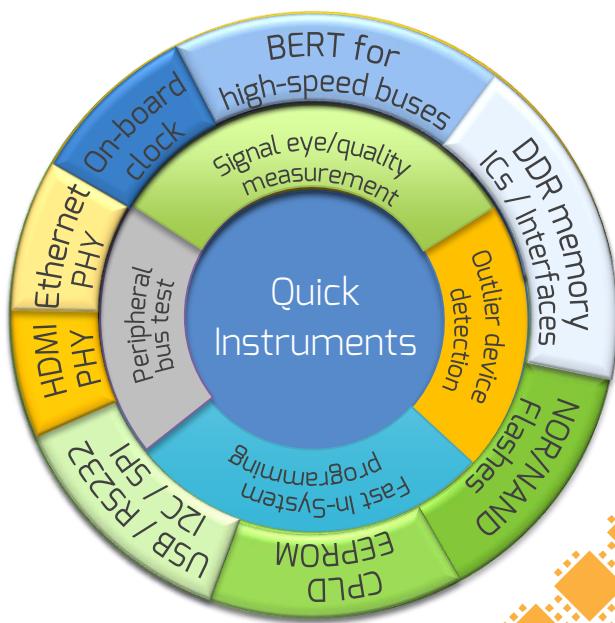
AT-A-GLANCE
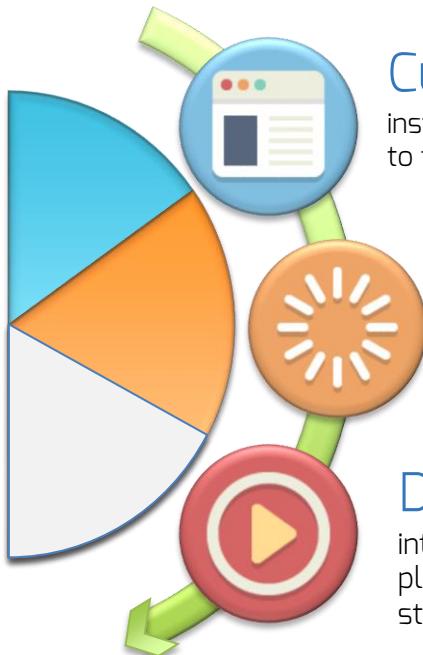
Customize. Choose the proper instrument from the library and customize it to the test requirements of your product.

Automate. Generate at-speed diagnostic tests for on-board components / connections, perform signal measurements and high-speed flash programming.

Deploy. Integrate the technology into your functional test flow and platform (e.g. PXI-based) or use it as a stand-alone solution.

Quick Instruments

- BERT for high-speed buses
- On-board clock
- Signal eye/quality measurement
- DDR memory ICs / Interfaces
- Ethernet PHY
- HDMI PHY
- Peripheral bus test
- Outlier device detection
- USB / RS232
- I2C / SPI
- Fast In-System programming
- CPLD EEPROM
- NOR/NAND Flashes

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HOW IT WORKS

Quick Instruments are essentially test IP cores that are automatically injected into on-board programmable devices (FPGA) during test phase. The instruments verify on-board components, check communication links, connections and peripheral interfaces. On top of this, the solution can rapidly program board flash and/or EEPROM with functional firmware.

Instruments library

Growing collection of Quick Instruments supports all the modern FPGAs, CPLDs and SoC-FPGAs, including the latest Xilinx, Altera and Lattice families. More than 1000 devices are already supported by the technology.

Test access layer

Embedded test IP cores are interfaced over JTAG bus (JTAG access is normally available on boards with FPGAs). The technology can re-use general-purpose I/O cards or serial cables to establish JTAG communication.
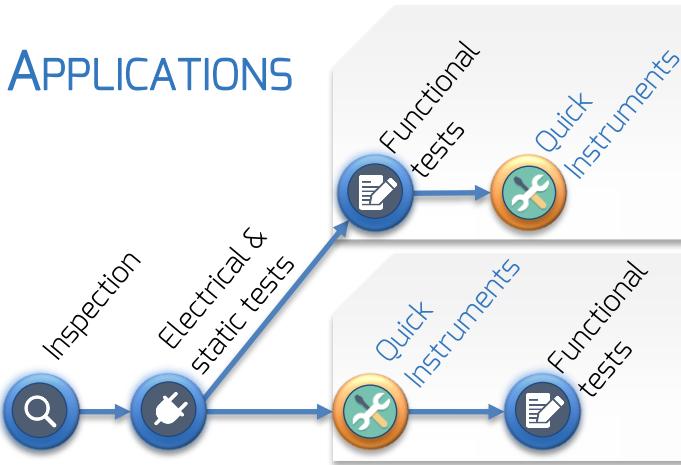
Run-time

All instruments are controlled by special software running on Windows PC. The software can run in standalone mode (command-line/GUI) as well as a part (DLL) of a third-party test execution suite.

Demo application

APPLICATIONS

Inspection → Electrical & static tests → Functional tests → Quick Instruments

At Troubleshooting Station

Quick Instruments help to narrow down the defect caused functional test to fail, thereby shortening the repair and retest cycle, saving personnel costs, eliminating trial-and-error troubleshooting style and reducing the amount of unrepairable boards.

Inspection → Electrical & static tests → Quick Instruments → Functional tests

At Production Line

When applied just prior to the main functional test phase, Quick Instruments would screen out defective parts without the need to run long-lasting functional and application tests.

TECHNOLOGY BENEFITS

IMPROVES TEST QUALITY

Quick Instruments enhance functional test coverage and quality thanks to automatically controlled test synthesis process that guarantees target/maximum coverage level and provides diagnostic data for troubleshooting.

LOWERS TEST DEVELOPMENT COSTS

Functional Test development effort, time and cost reduction is achieved due to automation provided by the solution. Now, the role of traditional functional test programs can be reduced to a simple fit-for-function proof.

REDUCES TEST ESCAPE RATE

The technology is targeting quality issues, marginal defects, timing related faults, performs BER/SNR estimations. In volume production environment it helps to quickly identify outliers that may otherwise pass all standard tests.

EASY INTEGRATION

Quick Instruments can be seamlessly integrated into existing test flow (e.g. based on NI TestStand® or other test management software). The technology supports and re-uses third-party T&M hardware (PXI I/O modules, 3rd-party I/O cards and cables) to access the electronic assembly under test.

FASTER PROTOTYPE BRING-UP

Prototype bring-up becomes faster as the hardware test for defects and specifications can be done in automated way long before the product's firmware is available to the HW design team.

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