Press Release

#emb2015 - New Software Test Tool Generation @embedded_world
Automated Software Test for single and multi-core embedded systems

In short:
- Software debugging, tracing and testing within one single IDE
- Unit, integration and system test
- No code instrumentation
- As close as possible to the real hardware
- Standard version free of charge

February 23, 2015 - iSYSTEM AG today released a new version of iSYSTEM test API and test case editor testIDEA. In 2009, more determined than a simple functional testing tool for software developers, testIDEA today is a comprehensive and flexible tool for the software test of single and multi-core embedded systems.

iSYSTEM' s Software and Blue Box Technology stand for fast and easy single and multi-core processor hardware access via any kind of debug interface. No matter whether one is developing, debugging or testing embedded software on a real hardware, iSYSTEM' s solutions work for you.

The new release comes with major improvements in the field of test case generation and test result visualization
- Increased comfort of test case creation - Test Case Generation Wizard
- Graphical representation of test case execution (call graphs, flow charts, UML sequence diagrams)
- Standalone application for both, Windows and Eclipse
- Multi-Core Testing
- Improvement of the test automation API to, e.g. import and/or export Python scripts

"12 years ago iSYSTEM developed hardware debuggers only, with a clear focus on supporting new microcontrollers in time. It all began with the publication of the iSYSTEM Application Programming Interface isystem.connect, an open and public API to remote control the iSYSTEM tools. This very powerful and easy to use interface led to more and more integration of other tools used in the embedded systems product life cycle to iSYSTEM Tools. It also increased the use of iSYSTEM Tool functionality within our customer's development process as well. Since about seven years, software testing gets more and more popular within the embedded market. One reason is to get control of the increasing complexity of software itself whereas standardization also defines testing as a major requirement for certification. This was the beginning of the iSYSTEM's test tool era. Today more and more of our customers use the debug and trace tool together with the test API and test editor to perform unit, integration and system testing.", says Erol Simsek, CEO of iSYSTEM.

The standard version of the test interface and test editor testIDEA are free and available on the download section of the website iSYSTEM.com. For the professional use, a license fee applies. The condition is that a Blue Box hardware and iSYSTEM Software is already in use.

Background:

How traditional unit testing of embedded software works?

In principle, a unit test is performed for an isolated function or module of a software. This test often runs in simulation on a PC. Thus, bugs can be detected very early in the process. Changes in the software may be quickly regression tested again. Appropriate documentation is generated automatically.

So-called Black and White Box testing is therefore possible. White Box testing, also named code coverage analysis is a test to detect un-tested or dead code. Performing and reusing the same tests on a real hardware involves many challenges:

- The code of the function under test is changed, in order to be executable on a real hardware at all. Thus, additional code is added. This test driver code changes the real-time behavior of a function too.
- Every test has to be compiled, linked and downloaded to the target hardware repeatedly. Thus, test cycles may be very time consuming.
- Because of its size, instrumented code may not fit into RAM or Flash anymore. So executing a test becomes impossible in this case.
- Using different compilers (PC, Cross-Compiler) may lead to different test results


Pic. 1 Traditional Testing

This type of software testing is widely used and well accepted in the embedded industry today. The hardware-based tests are then usually covered during system testing, so relatively late in the process.

Testing earlier and closer to the real hardware, as well as merging unit testing with integration and system testing, the iSYSTEM approach may be the right one.

What changes using iSYSTEM's Testing Solution?

The software under test corresponds to the un-changed software running on a real hardware. It consists of your code including all bugs. Even if those have been produced by other tools within the process. A test case can be executed repeatedly without re-compiling, linking and downloading it to the target:

- No additional libraries, no code instrumentation, no test harness or driver
- Includes compiler and linker results including code optimization and so forth
- Non-intrusive test execution on the real hardware in real-time
- No instrumentation of either source or machine code
- Libraries, legacy code or code from 3rd parties are included in the test run. Source code or debug information is not necessary. The behavior or misbehavior of such code is shown on machine code level (disassembly)
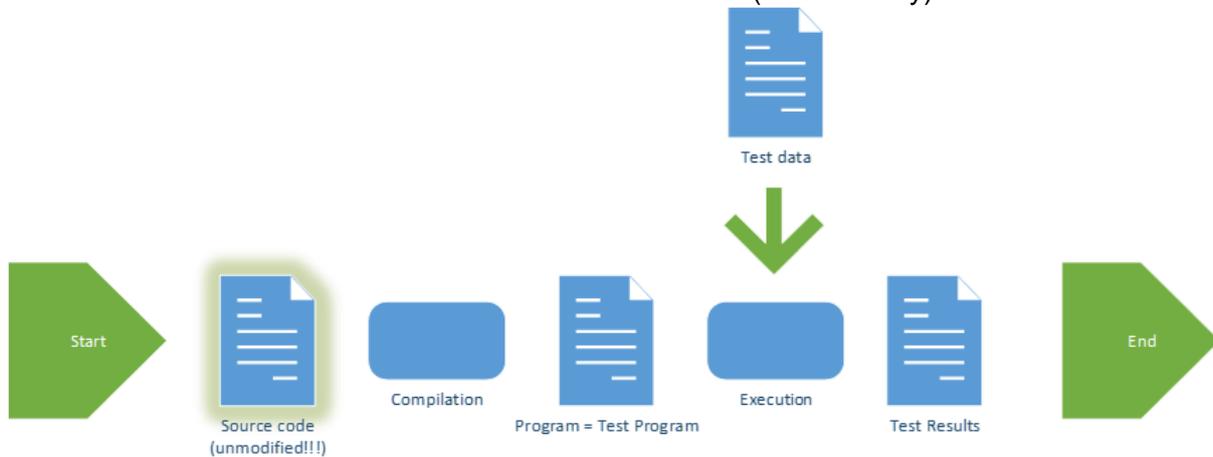
Pic. 2 iSYSTEM Testing Solution
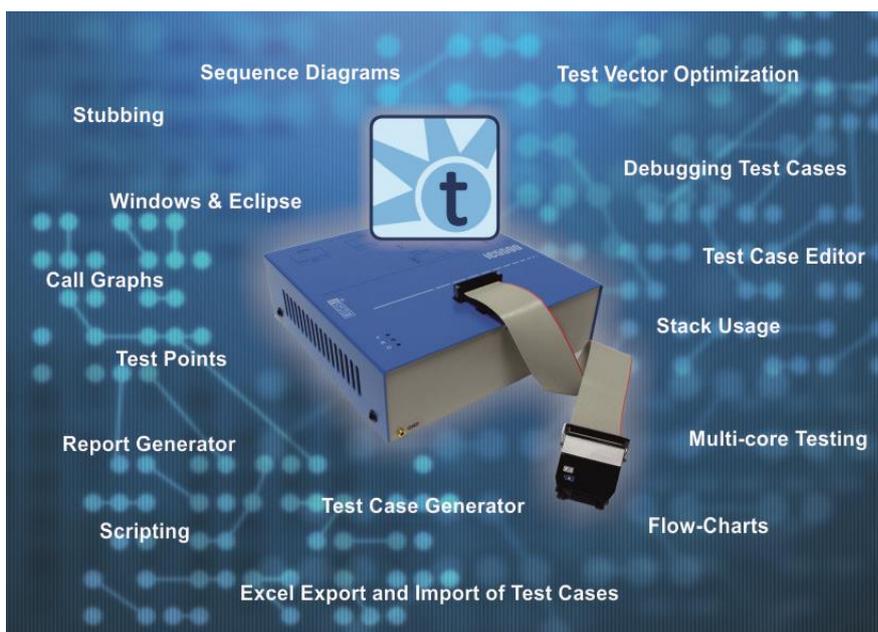
Pic. 3 It's all about Testing

The Embedded Software Tools Company

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About iSYSTEM

iSYSTEM is a privately held company headquartered in Germany, close to Munich with an R&D and Production center close to Ljubljana, Slovenia. Since its foundation in 1986, iSYSTEM is an independent manufacturer and provider of embedded software debugging, analysis and test tools. iSYSTEM' s Software and Blue Box Technology stand for fast and easy single and multi-core processor hardware access via any kind of debug interface. No matter whether one is developing, debugging or testing embedded software on a real hardware, iSYSTEM' s solutions work for you. The flexible integration and application of iSYSTEM solutions within the entire development process is enabled by open and public interfaces (APIs) that also allow engineers to automate timing analysis and testing. iSYSTEM maintains long standing and close relationships with all major semiconductor, operating system and compiler companies worldwide. This guarantees quick tool availability and the highest level of integration.

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