iSYSTEM provides debugger and analyzer solutions for more than 50 CPU architectures and their derivatives (3000+ microcontrollers). The Windows and/or Eclipse based development environment (winIDEA) is easy to learn and use. The flexible integration and application of iSYSTEM solutions within the entire development process is enabled by open and public interfaces (APIs).

iSYSTEM’s new fully software configurable iC5000 platform adapts to a multifunctional analyzer, development and test tool for many different processors and controllers. An optional I/O module adds the capability to generate, monitor and trace digital as well as analog signals. Additionally, iC5000 can measure the power and current consumption on target level.

Testing in general and especially according to functional safety standards is gaining more and more importance in the embedded world. iSYSTEM provides a real-time test tool (testIDEA) integrated in iSYSTEM’s development environment winIDEA that allows execution of test cases without code instrumentation!

iSYSTEM’s development and test process is transparent to customers. In addition they have access to iSYSTEM’s regression test tool suite. This enables users to validate iSYSTEM tools operate properly in the context of a safety project as required by a standard and any additional requirements of the users project (Tool Qualification).
The majority of iSYSTEM products represent a link between the embedded system and the host PC. Depending on the target CPU architecture, different tool configurations are available: on-chip debugger, on-chip debugger with trace and in-circuit emulator. The modular design allows to further use iSYSTEM products in new configurations. iSYSTEM tools support more than 50 different CPU architectures, 3000+ microcontrollers and more than 150 compilers.

**Debugger**

- Application debug & test over on-chip debug interfaces e.g. JTAG, BDM, SDI, OnCE, SWD, N-Wire, DAP, ...

**Analyzer**

- Application debug & test, real-time trace and analysis of program execution
- Trace port connections e.g. NEXUS, ETM, AURORA, ...
- Trace = record of program and data flow
- Profiler = performance measurement, data & function profiling, statistics
- Code coverage = statement, decision, MC/DC, function and call coverage

**Supported Architectures**

- **ARM**
  - Cortex-R
  - Cortex-A
  - ARM7/ARM9
  - Qorivva 5xxx
  - Freescale
  - MC9S12(x)
  - LPC4xx
  - NXP
  - LPC1xx
  - XMC4000
  - XMC1000
  - Infineon
  - AURIX™
  - XC2000/166
  - Xilinx
  - ZynQ

- **Cortex-M**
  - FM3
  - MC9S08
  - SH2/4
  - 78K0R
  - Renesas
  - V850
  - RL78
  - TMS570

- **Cortex-R**
  - FCR4
  - S12Z
  - R8C/3x
  - QorIQ
  - Freescale

- **Cortex-M**
  - Freescale
  - MC9S08
  - SH2/4
  - 78K0R
  - Renesas
  - V850
  - RL78
  - TMS570

- **Cortex-A**
  - Cortex-R
  - Cortex-A
  - ARM7/ARM9
  - Qorivva 5xxx
  - Freescale
  - MC9S12(x)
  - LPC4xx
  - NXP
  - LPC1xx
  - XMC4000
  - XMC1000
  - Infineon
  - AURIX™
  - XC2000/166
  - Xilinx
  - ZynQ

- **Freescale**
  - MC9S08
  - SH2/4
  - 78K0R
  - Freescale

- **Fujitsu**
  - SH2/4
  - 78K0R
  - R8C/3x

- **Renesas**
  - V850
  - RL78
  - TMS570

**winIDEA**

winIDEA is an integrated development environment (IDE) that complements all iSYSTEM hardware.

- Editor, project and build manager, high level debugger
- Tools to analyze program and data flow, performance measurement tools (with accuracy down to functional level), code coverage analysis, ...
- Display of significant data/events, e.g. special function registers, external signals (digital/analog), task switches, IRQs, power consumption, ...
- Multicore support
- Eclipse integration
- Version control system support

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testIDEA

iSYSTEM testIDEA offers **Real-Time Testing** by execution of test cases and test vectors on the final hardware **without code instrumentation**.

testIDEA uses the isystem.connect programming interface (see below) which is an open API set completely integrated in winIDEA. Using isystem.connect one can **write test applications/cases and also automatically execute them** on the hardware connected by iSYSTEM tools or 3rd party debuggers supported by winIDEA. Test applications and test cases can be written in many different **programming and scripting languages** (Python, Java, C/C++, C#, Perl, TCL…).

For an easy to use approach, **testIDEA includes a GUI** that simplifies **creation and execution of test cases and report generation**. All test cases can be reused in scripts. A tight association with Excel allows parameter import and export.

- GUI and script based test case creation with parameter import/export from/to Excel, CSV, CTE, XL Professional and others
- Test case execution on the final hardware **without code instrumentation**
- Test report generation (XML, YAML, CSV, Excel, DOORS)
- Regression test support
- Combine tests with trace, profiler and code coverage analysis
- Combine tests with iSYSTEM I/O modules
- Wide range of supported compilers

**isystem.connect**

The isystem.connect API enables external applications to remotely control iSYSTEM software/hardware and to record data from the target system while the application is running.

**Remote Control and Test API Architecture**

- **“Remote Control”** debug and test environment
- Transfer data automatically to/from other applications
- Support of many scripting and programming languages, e.g. Python, Perl, TCL, C/C++, C#, Java, ...

[Diagram of Remote Control and Test API Architecture]
iC5000 Test Platform

The iC500 is a **single hardware and software platform** that adapts through software updates to a multifunctional debugger, development and test tool for many different processors and controllers.

The optional I/O module adds the capability to generate, monitor and trace analog as well as digital signals. It also allows to measure the voltage, current and power consumption of a target hardware that winDEA can show with an accuracy down to function level.

### Available I/O Modules

- **IOM2**: 8 digital in, 8 digital out, 2 analog in, 2 analog out, system port
- **IOM2-D**: 24 digital in, 8 digital out, 2 analog out, system port
- Custom I/O Module on request

fitDEA - Automated Test Tool Suite

Standards for functional safety, such as **ISO26262** in automotive, describe provisions that must be fulfilled by an embedded systems manufacturer. This minimizes the risk that a software tool might insert failures or might not detect errors in the final product.

iSYSTEM provides a **Tool Pre-Qualification Environment** that consists of following parts:

- Reference hardware for different microcontrollers
- Test cases for functionality test of an on-chip debugger and trace tool, e.g. test cases for
  - Standard debugging
  - IDE functionality
  - Trace and profiling
  - Code coverage and unit testing
  - API testing
  - And more ...

[Diagram of iSYSTEM Development Environment & Debugger winDEA]

www.isystem.com