Embedded Development Tools

KEIL™ Tools by ARM

The Architecture for the Digital World®
Software Development Tools by ARM

ARM® tools enable developers to get the best from their ARM technology-based systems. Whether implementing an ARM processor-based SoC, writing software for an Applications Specific Standard Product (ASSP) or embedded microcontroller (MCU), ARM tools help developers rapidly create high quality, optimized code.
More than 20 years of continuous advancements and development have made ARM tools the industry standard for the ARM architecture.

**Unique Benefits**

The ARM tools range provides you with the best tools solution for all stages of system development. The tools are developed in parallel with the ARM processor IP, and offer unique benefits when compared to broad-based third-party tools providers.

- **High performance** – used in the development of billions of products
- **Reliable** – co-developed and validated with the ARM IP
- **Ease-of-use** – integrated, and validated toolchains
- **Comprehensive** – support for ALL ARM architectures and features
- **Roadmap** – long-term commitment to improvement, innovation and support
- **Support** – all ARM products are developed, supplied, and supported, by ARM and a global network of distributors.
## Embedded Tools Overview

<table>
<thead>
<tr>
<th>Software Tools</th>
<th>DS-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models</td>
<td>Fast Models</td>
</tr>
<tr>
<td>Debug Adapters</td>
<td>DSTREAM</td>
</tr>
<tr>
<td>Development Boards</td>
<td>Versatile Express</td>
</tr>
</tbody>
</table>
The ARM DS-5™ is the complete suite of software development tools for ARM processor-based standard devices as well as ASICs and SoCs. DS-5 accelerates your software development by providing an easy-to-use, integrated, and validated toolchain.

Key Features:

• Support for all ARM processors
• Powerful C/C++ industry-leading compilation tools
• Multicore aware debugger for all development stages from pre-silicon and board bring-up to OS porting and application debug
• Best-in-class system-wide performance and power analyzer for Linux and Android
• Instant correlation of performance-bottlenecks (e.g. cache misses & interrupts) and software execution
• Fast and accurate simulation enabling software development without the need for hardware
• Flexible C/C++ editor and project manager
• Large 3rd party plug-in ecosystem based on the Eclipse IDE
• Support and maintenance contract for one year.

Streamline Performance Analyzer

Streamline is the sample-based Linux and Android performance analysis tool in DS-5. Through a lightweight driver running on the target, Streamline captures target’s performance information from the ARM CPU, GPU and the OS, and displays it in a user friendly graphical interface.
DS-5 Debugger is a professional system-wide debug environment for the ARM Architecture

Streamline Performance Analyzer

www.arm.com/ds5
ARM Fast Models

ARM Fast Models™ offer a trusted portfolio of programmer’s view models of the latest ARM IP. The models are fast and accurate with integrated building blocks for virtual platforms, allowing software development to start months before hardware prototypes become available.

Key Features:

- Functionally accurate ARM Instruction Set Models, validated against ARM processor designs
- Models advanced ARM technologies such as caches, MMU, LPAE, virtualization, TrustZone®, and VFP
- Executes up to 250 million ARM instructions per second. This is comparable to hardware
- Boots any OS such as Linux, Android™, Windows Embedded CE, and Symbian in seconds
- Suitable for application, firmware, and early driver development
- SystemC TLM 2.0 export capability of ARM processor-based subsystems - integration with EDA solutions from Cadence, Carbon, Mentor Graphics, and Synopsys.

Platform Creation

To complement the models portfolio, Fast Models provide the tools and interfaces required to create Virtual Platforms. This includes the System Canvas platform creation environment, and the System Generator simulator build system.
Fast Models
Early access to a Virtual Platform for accelerated software development

www.arm.com/fastmodels
ARM Target Debug

DSTREAM

The DSTREAM™ high-performance debug and trace unit enables powerful software debug and optimization on any ARM processor-based hardware target. DSTREAM includes a 4GB trace buffer to allow high-bandwidth trace for long periods of time on fast targets.

DSTREAM enables the connection of DS-5 Debugger, RVD, and third party debuggers to ARM processor-based devices via JTAG or Serial-Wire Debug. It uses hardware acceleration to deliver high download speeds and fast stepping through code on single and multi-processor devices.

Key Features:

• Accelerated hardware bring-up for many development platforms
• Open debug interface for use with third-party tools.
DSTREAM
High-performance debug and trace unit

www.arm.com/dstream
ARM development boards are the ideal platform for accelerating the development and reducing the risk of new SoC designs. The combination of ASIC and FPGA technology in ARM boards delivers an optimal solution in terms of speed, accuracy, flexibility and cost.

ARM development boards are often used to:

- Evaluate, benchmark and start software development on the latest ARM processor systems
- Prototype, validate and develop software drivers for new SoC IP blocks - for example, a modem or video engine
- Test custom logic blocks or system IP in an FPGA, connected to an ARM core running at ASIC speed.

**Versatile Express Product Family**

Building a development system from ARM Versatile™ Express boards minimizes project setup time and allows the developer to concentrate on the task in hand - testing and validating the product IP and software, rather than designing and debugging the development system.

Versatile Express features a brand new bus architecture that improves bus/memory throughput over previous ARM development board families. The ARM Test Chip AMBA® AXI™ buses are directly connected to the user expansion FPGA, giving greater architectural accuracy and minimizing bus latency.
Versatile Express System Components

- uATX motherboard
- FPGA board (LogicTile)
- ARM processor board (CoreTile)

www.arm.com/boards
The Keil™ Microcontroller Development Kit (MDK-ARM™) is the complete development environment for ARM® Cortex™-M, ARM7™, and ARM9™ processor-based devices. MDK-ARM is optimized for MCU applications and combines the ARM C/C++ Compiler, the µVision™ IDE/Debugger, and the Keil RTX real-time operating system and middleware libraries. It delivers a single, powerful, yet easy-to-use environment for software developers.

**Key Features:**

- Out of the box support for more than 1700 devices enables faster application development start
- Industry-leading ARM C/C++ Compiler generates the smallest and fastest code
- Powerful µVision IDE, debugger and simulation environment
- Advanced analysis tools enable developers to quickly identify bottlenecks and defects within their code
- RTX, a fully-featured RTOS including source code
- Comprehensive middleware libraries allow easy implementation of complex networking and communication systems, ‘as well as graphical user interfaces
- Support for a wide range of debug adapters, including the ULINKpro™ which supports on-the-fly application analysis and unique streaming trace
- Complete Code Coverage identifies every instruction that has been executed, ensuring thorough testing of your application
- Numerous project examples and templates are included to help speed-up code development.
MDK-Professional integrates all development tools into the μVision IDE/Debugger, and includes a range of middleware libraries.

www.keil.com/arm
Keil ULINK Family

The ULINK™ Debug Adapters connect a PC’s USB port to a target system (via JTAG or SWD), enabling the debug and analysis of embedded programs running on target hardware.

All ULINK adapters enable developers to:

• Download programs to your target hardware
• Examine memory and registers
• Single-step through programs and insert multiple breakpoints
• Run programs in real-time
• Program Flash Memory
• Connect using JTAG or Serial Wire modes
• On-the-fly debug of ARM Cortex-M series processor-based devices
• Examine Trace information from ARM Cortex-M3 and Cortex-M4 processor-based devices.

The ULINK Family includes:

• The ULINKpro™ - provides unique streaming trace directly to your PC, enabling advanced analysis of your applications such as Execution Profiling and Code Coverage
• The ULINK2™ - supports ARM7, ARM9, Cortex-M, 8051 and C166 processor-based devices
• The ULINK-ME™ - a low cost debug adapter for Cortex-M processor-based devices which is only available with Keil Evaluation boards.
ULINK Debug Adapters allow you to debug and analyze embedded programs running on target hardware

www.keil.com/ulink
Keil designs and manufactures evaluation boards and starter kits to enable developers to evaluate a new MCU architecture and get started with the Keil development tools.

All Keil boards are ready to run straight out of the box and include everything needed to get started quickly.

**Evaluation Boards provide:**

- A wide range of evaluation boards for ARM7, ARM9, Cortex-M and Cortex-R4 processor-based MCUs
- Hardware support for Ethernet, CAN, USB, Host and Device, SD Card, serial interfaces, and graphical LCDs
- Example projects to save you time and help you get started
- All boards and starter kits include evaluation software, cables, documentation, and example programs
- Choose a suitable board from the comparison tables at www.keil.com/boards.
All Keil boards and starter kits include evaluation software, cables, documentation, and example projects.

www.keil.com/boards
For More Tools Resources

Visit www.arm.com/tools and www.keil.com
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