Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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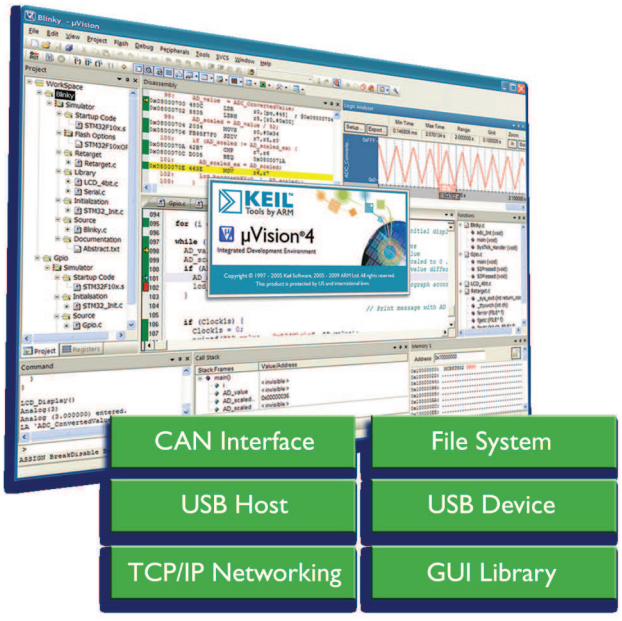
MDK-ARM Version 5
Microcontroller Development Kit

KEIL™ Tools by ARM



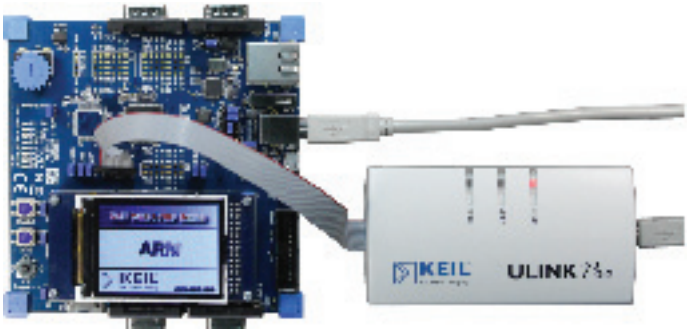
Keil™ MDK-ARM™ (Microcontroller Development Kit) the complete software development environment for ARM processor-based microcontrollers.

- Out-of-the box support for over 1000 ARM® processor-based microcontrollers
- Software Packs with ready-to-use CMSIS and middleware components
- Numerous example projects and templates
- Powerful µVision™ IDE, debugger and simulation envirionment
- On-the-fly application analysis records full instruction trace with the ULINK*pro*™ Debug Adapter
- Complete Code Coverage information about your program's execution.
- Execution Profiler and Performance Analyzer for analyzing and optimizing your code.
- CMSIS RTOS RTX real-time operating system with full debugger support.
- Complete and comprehensive middleware including TCP/IP Networking, File Systems and USB.
- Industry-leading ARM C/C++ Compiler with advanced processor-specific optimizations and MicroLib.
- Editor with Code Completion and Dynamic Syntax Checking.

ULINK Debug Adapters

The ULINK™ family of USB Debug Adapters connect a PC's USB port to a target system (via JTAG or SWD), allowing developers to debug and analyze embedded programs executed on target hardware.

The ULINK*pro* provides unique streaming trace directly to a PC, enabling advanced analysis of your applications such as Execution Profiling and Code Coverage.



Features	ULINK*pro*	ULINK2
Run Control debug (ARM Cortex®-M series)	Yes	Yes
Memory + Breakpoint (while running)	Yes	Yes
Data Trace (Cortex-M3 and Cortex-M4)	Yes	Yes
Instruction Trace (Cortex-M3 and Cortex-M4)	Yes	-
Performance		
JTAG Clock speed	50MHz	10MHz
Memory read/write	1MByte/s	25KByte/s
Data Trace streaming (UART mode)	-	1Mbit/s
Data Trace streaming (Manchester mode)	100Mbit/s	-
ETM Trace streaming	800Mbit/s	
Analysis Tools		
Logic Analyzer	Yes	Yes
Performance Analyzer	Yes	-
Execution Profiler	Yes	-
Code Coverage	Yes	-

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MDK Core & Software Packs

MDK Version 5 is now split into the MDK Core and Software Packs which makes new device support and middleware updates independent from the toolchain. The MDK Core contains all development tools including IDE, Compiler, and Debugger. Software Packs contain device support, CMSIS, and middleware and are installed and updated on demand using the Pack Installer.

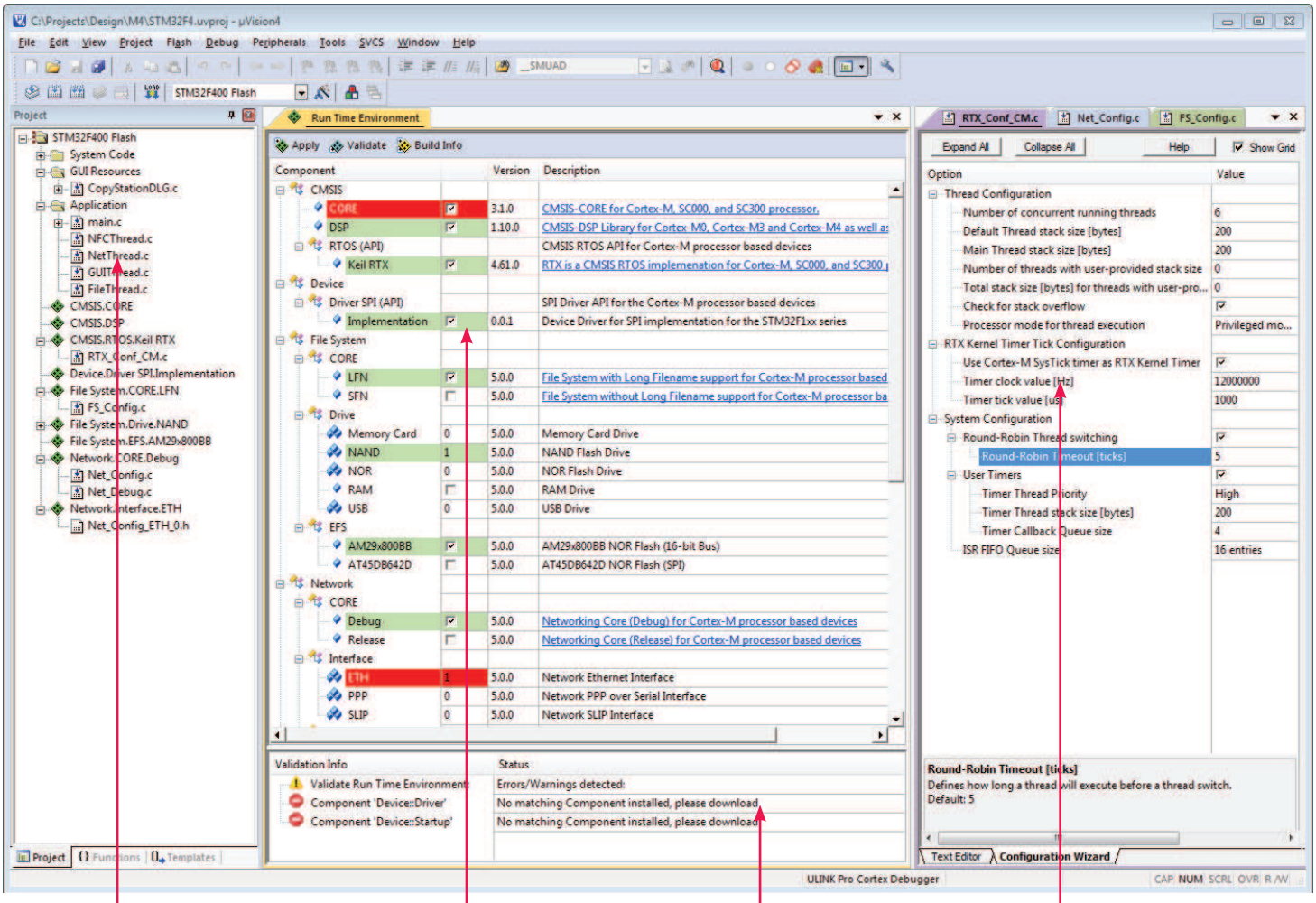
Software Packs contain software components that collect libraries, source modules, configuration and header files, and documentation. Software components are generic and support a wide range of devices and applications. The Software Pack structure allows integration of 3rd-party software components.

Device Database®

When you create a project and select a target device from the integrated Device Database µVision pre-configures the development tools for you and shows only options that are relevant for the selected device.

Run-Time Environment

The Run-Time Environment window shows all software components that are compatible with the selected device. Choose from these pre-built software components to accelerate your project development. Just select components you need for your application and µVision creates the required run-time environment for you.



The **Project Window** shows application source files of selected software components.

Create the **Run-Time Environment** from Software Packs with pre-built software components.

Inter-dependencies of software components are clearly identified with validation messages.

The **Configuration Wizard** simplifies the setup for selected software components.

µVision IDE

µVision integrates a robust editor, project manager and build facility for efficient software development. The flexible window management system supports multiple screens and enables you to drag and drop individual windows anywhere on the visual surface.

Project Targets

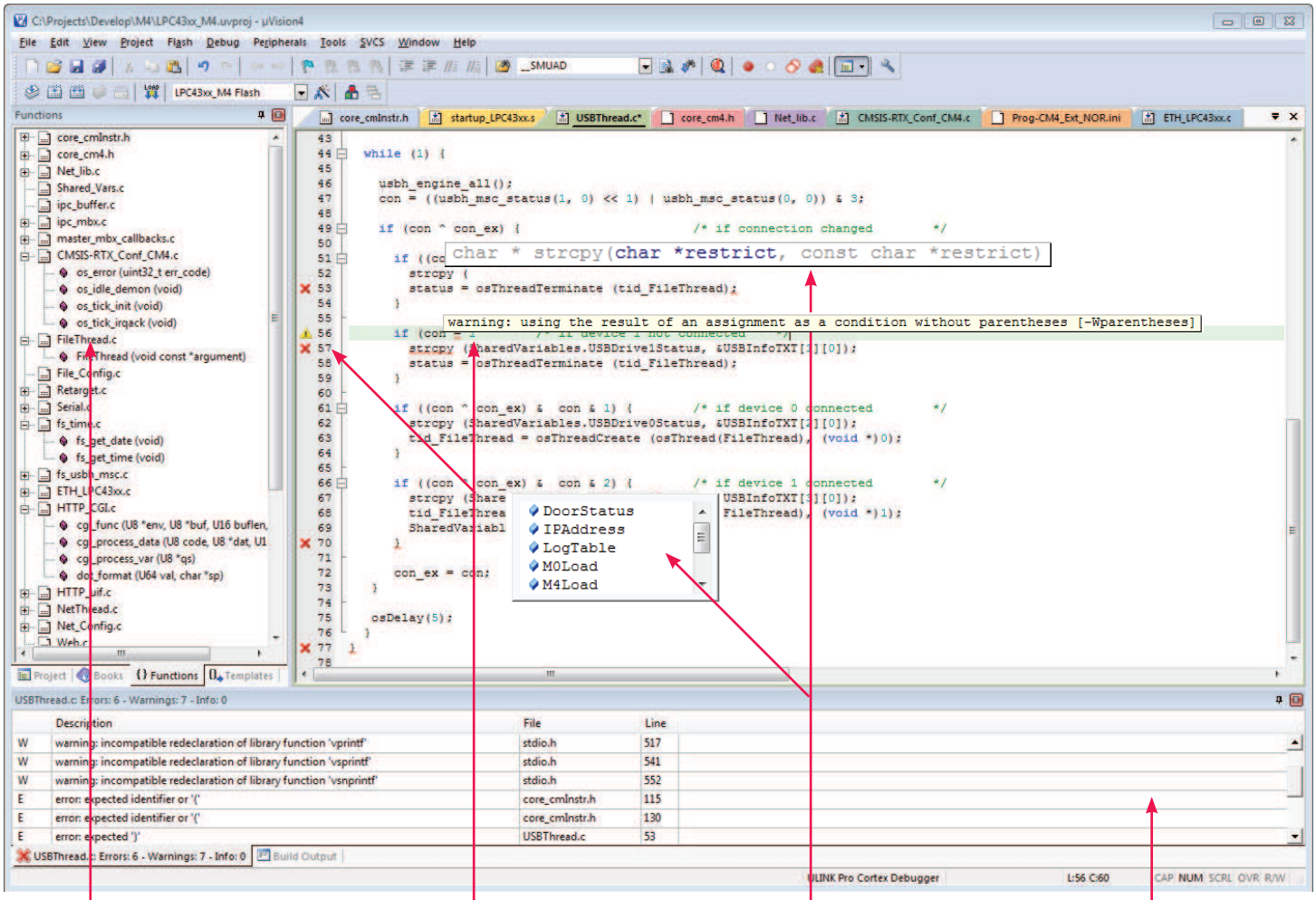
Projects support multiple targets that contain the same file groups and Software Components. Project targets ease configuration management and may be used to generate debug and release builds or adaptations for different hardware platforms.

Source Code Editor

The integrated editor is even available during debugging and includes all standard features you are accustomed to in a source code editor. Color syntax highlighting, text indentation, and source outlining are optimized for C/C++.

Code Completion

New editor features enhance your productivity while developing C/C++ source code. The Code Completion List and Function Parameter information helps you to keep track of symbols, functions, and parameters. Dynamic Syntax Checking validates the program syntax while you are typing and provides real-time alerts to potential code violations before compilation.



The **Functions** window gives fast access to functions for each C/C++ source code module.

Dynamic Syntax Checking shows syntax violations and reduces edit, compile, correction cycles.

While typing code the editor shows **Function Parameters** and the **Code Completion** list.

The **Error List** window summarizes all potiential syntax errors and warnings in the current module.

Verify

µVision Debugger

The µVision Debugger provides a single environment in which you may test, verify, and optimize your application code. The debugger includes traditional features like simple and complex breakpoints, watch windows, and execution control and provides full visibility to device peripherals.

RTOS Awareness

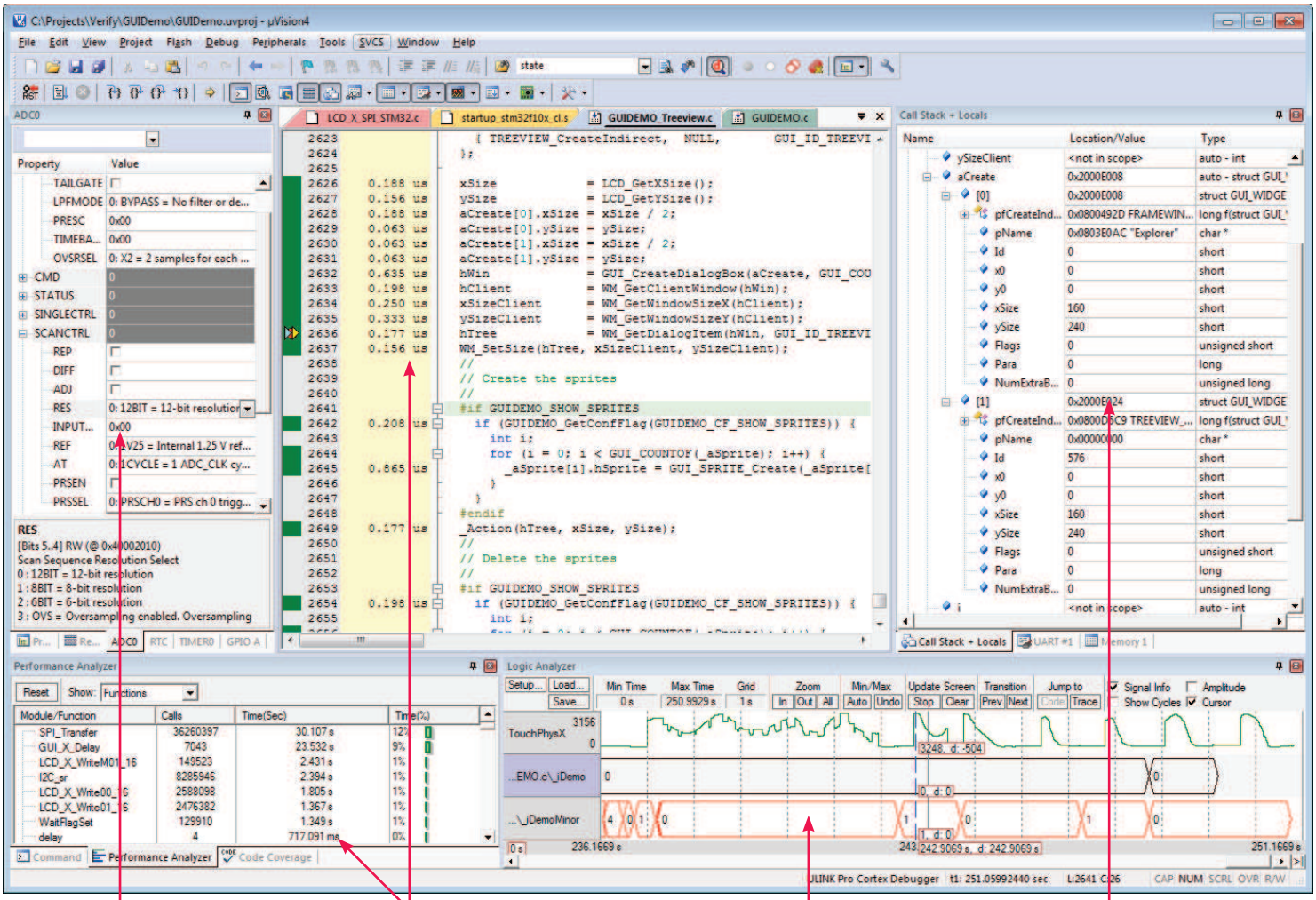
The RTX real-time operating system is fully integrated into the debugger making it easy to monitor thread status and kernel activity in the RTX Task and System window. The RTOS Event Viewer displays thread activity and allows identification of thread priority issues in your application.

Integrated Analysis Tools

When using ULINK*pro* with Streaming Trace, advanced analysis tools show how your program is performing. Code Coverage provides detailed execution statistics for certification testing and validation. The Performance Analyzer with execution profiler helps you to identify and optimize hot-spots in your application code.

Code and Data Trace

Code and data trace can be captured on many Cortex-M series processor-based devices using Streaming Trace with ETM or Trace Buffering with ETB or MTB. Trace can help you to find complex timing problems or sporadic software issues.



Middleware Pack

Today's microcontroller devices offer a wide range of communication interfaces to meet any embedded design requirement. However, implementing these interfaces presents software developers with real challenges. Middleware components are essential for developers to make efficient use of the device capabilities.

MDK-Professional includes a number of royalty-free, tightly coupled middleware components which enable developers to more easily implement complex communication interfaces in their applications. Middleware components include:

- Graphical User Interface
- USB Host and Device
- TCP Networking Suite
- Flash File System
- CAN Driver

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All middleware components are specifically designed and optimized for ARM processor-based MCU devices. The libraries are seamlessly integrated with the µVision environment and offer a modular design with well documented APIs.

Graphical User Interface (GUI)

The GUI Library is a fully featured graphics suite that makes it possible to add graphical user interfaces to embedded applications. It supports a large number of displays and includes tools for rapid GUI creation.

- Supports monochrome, grayscale and color LCDs
- Drivers for many displays and display controllers included
- Window Manager for handling multiple windows
- Many widget-like buttons, checkboxes and icons available
- Skinning support for a custom look and feel
- Optimized for speed and size
- Wide range of examples for evaluation boards.

USB Device and Host

MDK-Professional provides USB Device and USB Host support for embedded systems.

The USB Device interface uses standard device driver classes that are available with all Windows PCs. No Windows host driver development is required. The USB Device interface uses a generic software layer using RTX Kernel features.

TCP/IP Networking Suite

The TCP/IP library is a full networking suite optimized for ARM and Cortex-M processor-based MCUs. It has a small code footprint, and delivers excellent performance.

The suite provides comprehensive support for transmission protocols such as TCP/IP and UDP, as well as application level services and clients including HTTP, Telnet, SMTP, SNMP, and FTP. It provides all the features required for modern networking communication in embedded systems.

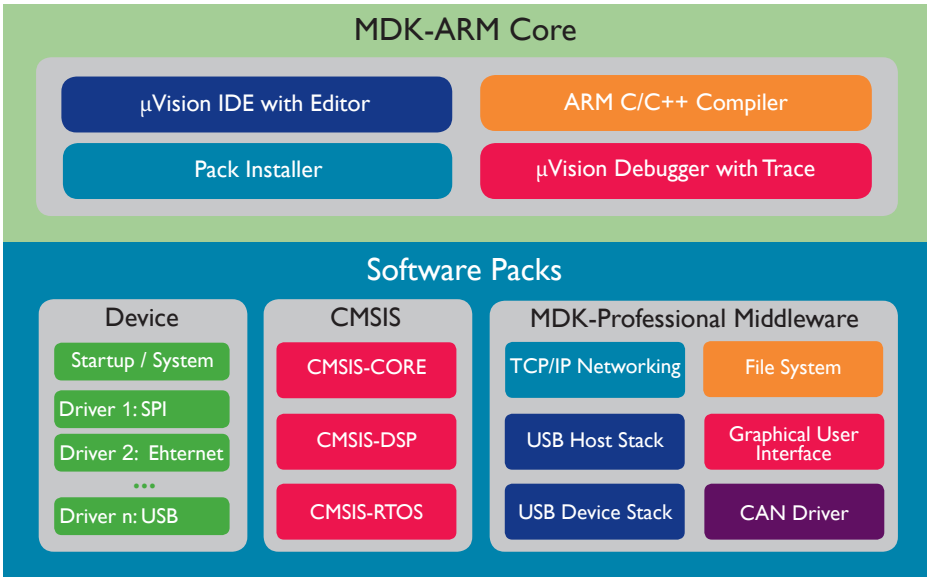
MDK Middleware components allow you to develop robust applications using a wide variety of communication protocols.

Flash File System

The Flash File System allows your embedded applications to create, save, read, and modify files in a wide range of standard storage devices. The Flash File System offers:

- Standard ANSI C File I/O application interface
- NOR and NAND Flash support
- RAM, ROM, and SD/MMC/SDHC Memory Cards
- FAT12, FAT16, and FAT32 formats
- SD/MMC card file-caching
- Reentrant and thread-safe operation
- Simultaneous access to multiple storage devices.

MDK-ARM Microcontroller Development Kit



MDK-ARM Core

The MDK-ARM Core contains all the development tools. MDK-ARM is easy to use, yet powerful enough for the most demanding embedded applications.

Software Packs

Software Packs are added on-demand using the Pack Installer. Software Packs contain device support, CMSIS, and middleware components that are essential for efficient software development

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MDK Product Selector:	MDK-Lite	MDK-Cortex-M	MDK-Standard	MDK-Professional
MDK-ARM Core Components				
µVision IDE with editor	✓	✓	✓	✓
µVision Debugger and Trace	32KB	✓	✓	✓
ARM C/C++ Compiler	32KB	✓	✓	✓
Pack Installer	✓	✓	✓	✓
ARM Processor Support:				
Cortex-M series processors	✓	✓	✓	✓
Cortex-R4, ARM7 & ARM9	✓		✓	✓
SecurCore			✓	✓
RTOS & Middleware Libraries:				
MDK-Professional Middleware				✓
CMSIS-RTOS RTX with source code	✓	✓	✓	✓
3rd Party RTOS Support	✓	✓	✓	✓

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Program examples and detailed technical information are available from your distributor and our web site (www.keil.com).