

# KEIL™ DEVELOPMENT TOOLS FOR INFINEON XC800/XC166

## Infineon XC800 8-bit Microcontrollers

The XC800 microcontroller family combines a high-performance 8051 core, on-chip Flash and RAM, and a powerful mix of peripherals like CAN, LIN, A/D Converter, and enhanced Compare/Capture. These devices reduce system costs because of their highly-integrated features and ability to operate at 3.3V or 5V. XC800 applications are easily migrated to the more powerful XC166 devices.

**Keil C51 Version 8**  
**Supports Infineon XC800 Devices**

**Keil C166 Version 6**  
**Supports Infineon XC166 Devices**

### XC800 Device Overview

Part Number	CPU Clock (MHz)	Timers	Flash (bytes)	E <sup>2</sup> -Prom (bytes)	RAM (bytes)	ADC	GPIO (max)	CAP COM	MDU	Interfaces
XC866L	26.67	3	8/16K	Up to 4K	768	8	27	3+1		UART, SSC, LIN
XC886CLM	24	4	24/32K	Up to 8K	1792	8	34	3+1	✓	2xUART, SSC, CAN, LIN
XC888CLM	24	4	24/32K	Up to 8K	1792	8	48	3+1	✓	2xUART, SSC, CAN, LIN

For a complete list of XC800 devices, refer to [www.keil.com/infineon](http://www.keil.com/infineon)

## Infineon XC166 16-bit Microcontrollers

The XC166 microcontroller family extends the popular C166 family to include a wide range of products scalable in performance, memory, and peripherals. It is easy to migrate existing applications to the XC166 and improve performance as XC166 devices are speed-optimized and include a Multiply and Accumulate Unit (MAC) that may be used for sophisticated DSP algorithms.

### XC166 Device Overview

Family	Part Number	CPU Clock (MHz)	ROM/Flash (bytes)	RAM (bytes)	GPIO (max)	ADC	CAP COM	Interfaces
<b>XC161</b>	XC161CJ-16F20F/-16F40F	20/40	128K Flash	8K	99	12	32+3+1	2xUART, 2xSSC, I <sup>2</sup> C, 2xCAN, J1850
	XC161CS-32F20F/-32F40F	20/40	256K Flash	12K	99	12	32+3+1	2xUART, 2xSSC, I <sup>2</sup> C, 2xCAN
<b>XC164CM</b>	XC164CM-4F20F/-4F40F	20/40	32K Flash	4K	47	14	16+3+1	2xUART, 2xSSC, 2xCAN
	XC164CM-8F20F/-8F40F	20/40	64K Flash	6K	47	14	16+3+1	2xUART, 2xSSC, 2xCAN
<b>XC164CS</b>	XC164CS-8F20F/-8F40F	20/40	64K Flash	8K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-8R20F/-8R40F	20/40	64K ROM	8K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-16F20F/-16F40F	20/40	128K Flash	8K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-16R20F/-16R40F	20/40	128K ROM	8K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-32F20F/-32F40F	20/40	256K Flash	12K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-32R20F/-32R40F	20/40	256K ROM	12K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
	XC164CS-32R20F/-32R40F	20/40	256K ROM	12K	79	14	32+3+1	2xUART, 2xSSC, 2xCAN
<b>XC167</b>	XC167CI-16F20F/-16F40F	20/40	128K Flash	8K	103	16	32+3+1	2xUART, 2xSSC, I <sup>2</sup> C, 2xCAN
	XC167CI-32F20F/-32F40F	20/40	128K Flash	12K	103	16	32+3+1	2xUART, 2xSSC, I <sup>2</sup> C, 2xCAN

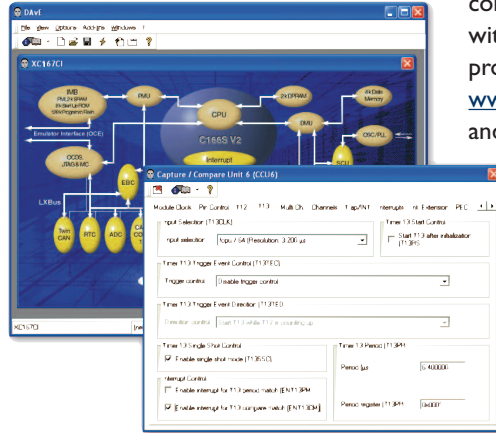
For a complete list of XC166 devices, refer to [www.keil.com/infineon](http://www.keil.com/infineon)

# Creating XC800 & XC166 Projects

## Step 1. Setup Device/Peripherals

DAvE is an Expert Wizard for Infineon microcontrollers that automatically configures your system and helps you get started. It provides menu driven templates that generate driver code for all on-chip peripherals. DAvE shortens the learning curve and helps you rapidly get started developing working source code.

DAvE is freely available from the Infineon web site. For more information, refer to [www.infineon.com/DAvE](http://www.infineon.com/DAvE)



## Step 2. Import Into µVision®

Once you have used DAvE to generate CPU and peripheral settings, import the DAvE project into the Keil µVision IDE and create the remaining application code.

The µVision IDE integrates the most efficient C compilers for the Infineon XC800 and XC166 devices with all the tools required to create executable programs. Program examples are found at [www.keil.com/download](http://www.keil.com/download) and [www.keil.com/appnotes](http://www.keil.com/appnotes)

- Application Note 182 shows how to create µVision projects using DAvE.
- Application Note 178 shows how to use the MAC Unit on the XC166 devices to implement DSP algorithms for signal processing.

Each project may contain multiple target configurations.

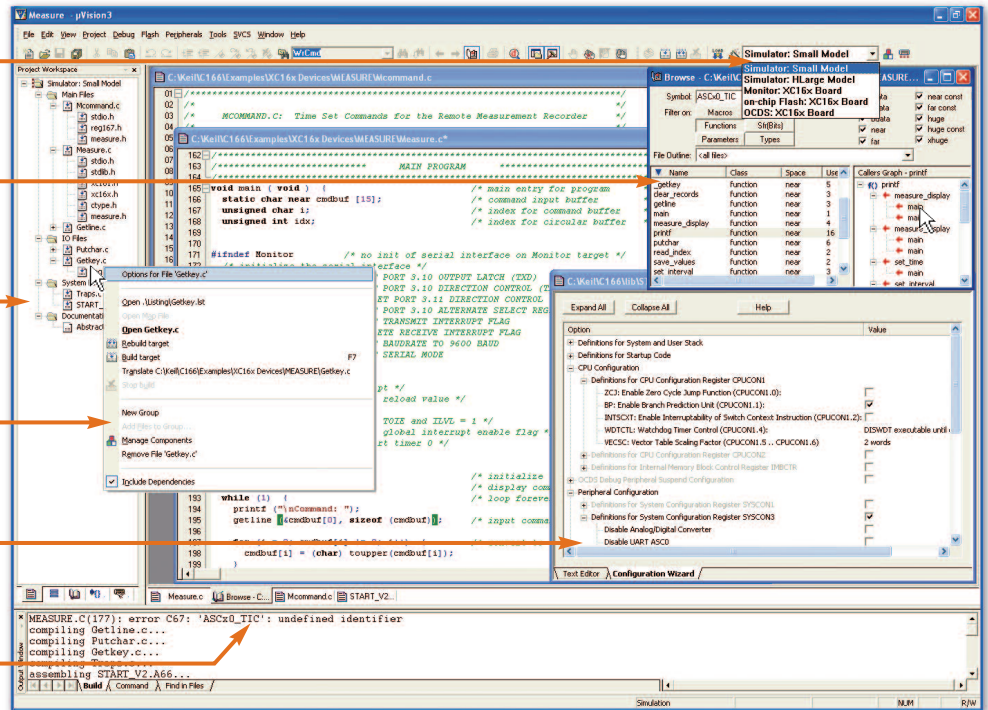
The source browser lists program objects and allows rapid source navigation.

The project workspace lists source and header files and helps organize your project.

Context menus provide flexible configuration of all aspects of your project.

The configuration wizard simplifies editing setup files.

Double-click on messages to locate the erroneous line in the source code.



µVision ensures easy and consistent project management. A single project file saves all configuration information and the Device Database® automatically sets all tool options and customizes dialogs.

## Step 3. Test Application with $\mu$ Vision

Once you have created your application program you need to debug it. The  $\mu$ Vision Debugger may be configured as a simulator (where programs run on your PC) or as a target debugger (where programs run on your target hardware), on the Debug tab of the Options for Target dialog. The simulator is a software-only product that simulates most features of

Infiniteon devices without actually having target hardware.  $\mu$ Vision simulates a wide variety of peripherals including the serial port, external I/O, timers, and interrupts. The actual peripherals simulated are dependant on the chip. Simulated capabilities are based on the MCU selected from the device database for your project target.

The toolbox contains buttons you define to run commands or debug functions.

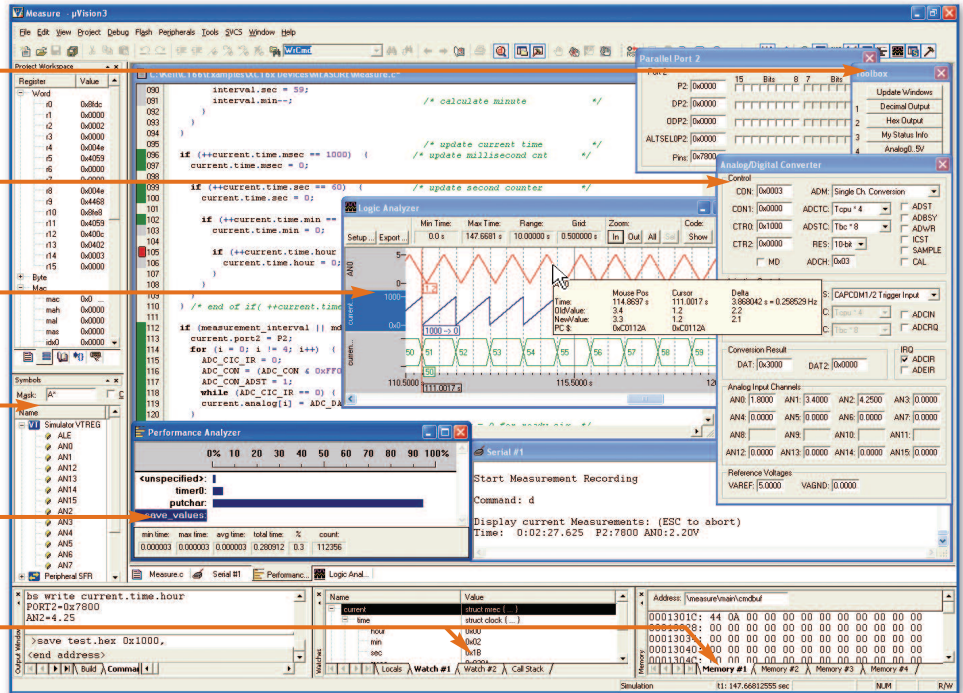
Peripheral dialogs display status information and aid in driver development.

The logic analyzer shows changes to variables and signals over time.

You may drag and drop symbol names to other debugger windows.

The performance analyzer displays execution times for program blocks.

Memory and watch windows display important program variables.

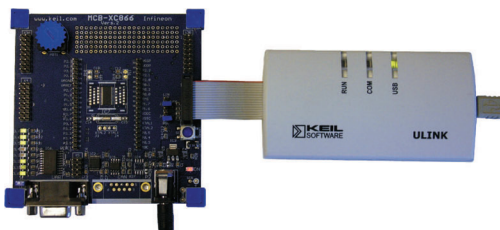


$\mu$ Vision provides a single environment for editing, simulating, Flash programming, and testing target hardware. Most editor and debugger functions are accessible from the toolbar.

## Step 4. Run on Target Hardware

Infiniteon microcontrollers integrate an On-Chip Debugging system (OCDS). To interactively test and debug programs, you can use the Keil ULINK™ USB-JTAG Adapter or Infiniteon Debug Access Server (DAS) compatible hardware.

The Keil ULINK USB-JTAG Adapter connects your PC's USB port to the OCDS debugging connector of your target system.



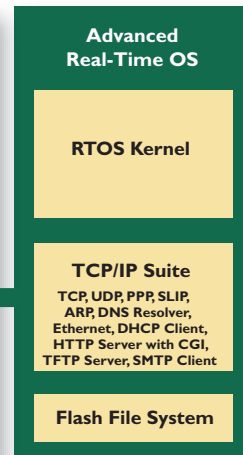
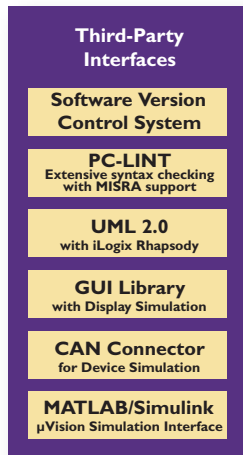
ULINK supports Flash programming, single-stepping, real-time program execution with breakpoints, and access to memory and CPU registers. For more information, refer to [www.keil.com/ulink](http://www.keil.com/ulink)

ULINK requires that your target system has an OCDS connector. Alternatively, you may get started with OCDS-ready XCI66 or XC800 evaluation boards from Keil. For more information, refer to [www.keil.com/boards](http://www.keil.com/boards)

# Keil Development Tools for Infineon XC800/XC166



Keil is the world-wide leader in development tools for the Infineon XC800 and XC166 microcontrollers. Tools from Keil support all levels of developer, from the beginner just starting out to the professional applications engineer. Keil offers a wide range of products including evaluation boards and the ULINK USB-JTAG adapter for Flash programming and In-System Debugging. For more information, see [www.keil.com/infineon](http://www.keil.com/infineon)



The Keil PK51 and PK166 Professional Developer's Kits are complete software development environments for Infineon 8-bit and 16-bit microcontrollers. The kits include the tools you need to create, translate, and debug C and assembly source files. Like all Keil tools, these kits are easy to learn and easy to use yet powerful enough for the most demanding embedded applications. The integrated Device Database configures the tools options for each specific microcontroller. For a complete list of supported devices, refer to [www.keil.com/dd](http://www.keil.com/dd)

The Advanced RTOS is a real-time kernel for the XC166/CI66 that simplifies the design and implementation of complex, time-critical applications. For more information, refer to [www.keil.com/ar166](http://www.keil.com/ar166)



Bretonischer Ring 15  
85630 Grasbrunn  
Germany  
Phone +49 89 / 45 60 40 - 0  
FAX +49 89 / 46 81 62

ARM, ARM Powered, StrongARM, Thumb, Multi-ICE, Micropack, ModelGen, Move, PrimeCell, PrimeXsys, RealView, Jazelle, ARM7TDMI, ARM9TDMI, ARMulator, AMBA, and The Architecture for the Digital World are registered trademarks of ARM Limited. AXI, ARM7, ARM7TDMI-S, ARM7EJ-S, ARM720T, ARM740T, ARM9, ARM9TDMI, ARM920T, ARM922T, ARM940T, ARM9E, ARM9E-S, ARM926EJ-S, ARM946E, ARM946E-S, ARM966E-S, ARM10, ARM1020E, ARM1022E, ARM1026EJ-S, ARM11, ARM1136J-S, ARM1136JF-S, ARM1156T2-S, ARM1156T2F-S, ARM1176JZ-S, ARM1176JZF-S, EmbeddedICE, EmbeddedICE-RT, AMBA, ARM Developer Suite, ETM, ETM7, ETM9, ETM10, ETM10RV, ETM11, Embedded Trace Macrocell, Embedded Trace Buffer, ETB, ETB11, Embedded Trace Kit, Integrator, JTEK, MultiTrace, MPCore, MOVE, OptimoDE, SecurCore, SC100, SC110, SC200, SC210, TrustZone, KEIL, µVision are trademarks of ARM Limited or its subsidiary companies. Java is a trademark of Sun Microsystems, Inc. XScale is a trademark of Intel Corporation. All other brand names or product names are the property of their respective holders. "ARM" is used to represent ARM Holdings plc (LSE: ARM and NASDAQ: ARMHY); its operating company ARM Limited and the regional subsidiaries ARM, INC.; ARM KK; ARM Korea Ltd.; ARM Taiwan; ARM France SAS; ARM Consulting (Shanghai) Co. Ltd.; ARM Belgium N.V.; and ARM Embedded Technologies Pvt. Ltd. Neither the whole nor any part of the information contained in, or the product described in, this document may be adapted or reproduced in any material form except with the prior written permission of the copyright holder. The product described in this document is subject to continuous developments and improvements. All particulars of the product and its use contained in this document are given by ARM in good faith. All warranties implied or expressed, including but not limited to implied warranties of satisfactory quality or fitness for purpose are excluded. This document is intended only to provide information to the reader about the product. To the extent permitted by local laws ARM shall not be liable for any loss or damage arising from the use of any information in this document or any error or omission in such information.