

Abstract

This application note demonstrates how to use DAVE3 and MDK Version 5 to accelerate the development cycle when creating applications for Infineon’s XMC industrial microcontroller families. Using both tools together will give you an easy-to-use development flow. It combines DAVE’s powerful configuration tools and Apps library with μ Vision’s project management, debug capabilities, and the ARM C/C++ compiler.

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Introduction

Infineon DAVE3 and Keil MDK-ARM both provide unique features that aid the software development for the Infineon XMC industrial microcontroller families XMC1000 and XMC4000.

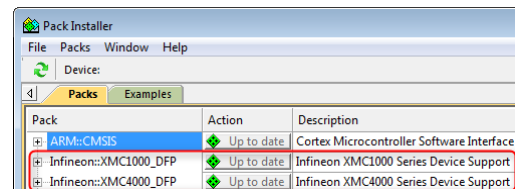
DAVE3 provides a convenient way to configure the MCU (pin-multiplexing, clock settings, and assignment of peripherals) and setup a basic application framework with peripheral drivers. It supports automatic code generation based on predefined software components, the so-called "DAVE Apps". DAVE Apps are configured in the Eclipse GUI.

MDK-ARM features the ARM C/C++ Compiler for improved code density and execution performance of the embedded application. The μ Vision IDE provides best visibility for debugging with its built-in CMSIS-SVD peripheral views and CMSIS-RTOS awareness. The middleware that is part of MDK-Professional enhances application development for communication peripherals in microcontrollers. Using the new Software Pack concept, it is very easy to integrate third party software components into a μ Vision project.

Prerequisites

To make use of the proposed flow, you need to install the following software:

- DAVE Version 3.1.10 or above (www.infineon.com/dave)
- MDK-ARM Version 5.10 or above (www.keil.com/mdk5)
 - Using Pack Installer, make sure that the software packs from Infineon supporting the XMC families are installed on your system:



This application note assumes that the user is familiar and up-to-date with DAVE3 and has some experience with the MDK-ARM development tool. A XMC-based development board with debug adapter (either integrated or external) is required to download and debug the application on real hardware.

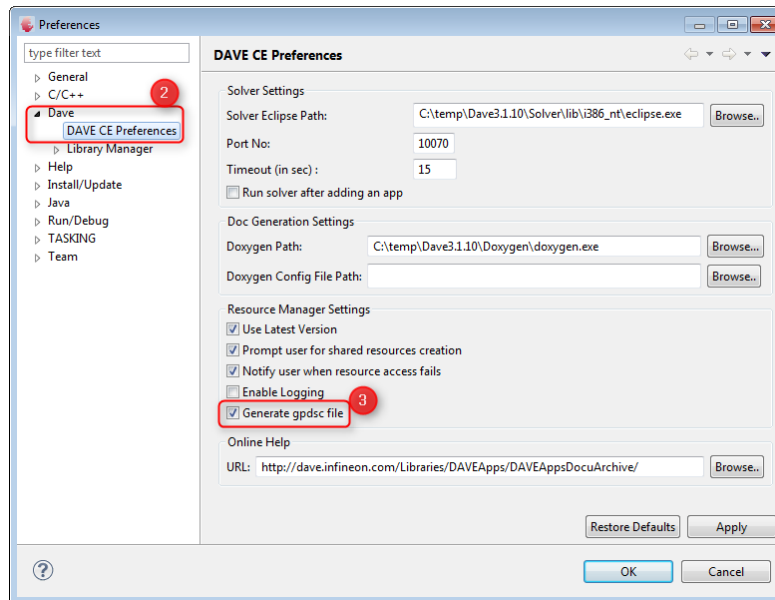
Work with DAVE3

DAVE3 generates code that can be debugged with μ Vision. To exchange project data between DAVE and μ Vision, DAVE 3.1.10 is now capable of creating Generator Package Description Files (GPDSC). These files contain the description of the software components generated by the DAVE project configuration. They will be picked up and included into the μ Vision project.

Prepare DAVE

You need to configure DAVE to create a GPDSC file when using the **Generate Code** button.

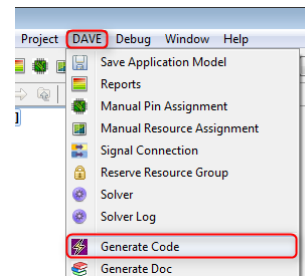
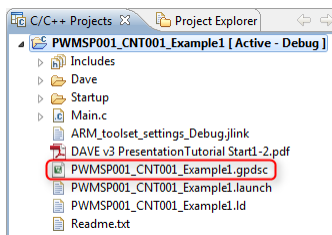
1. Click on **Window – Preferences**
2. Click on **Dave – DAVE CE Preferences**
3. Select **Generate gpdsc file**



Use DAVE3

Now you are ready to exchange project information with μ Vision.

1. Open an existing project of your choice or create a new one from scratch.
2. Configure your device (pin-multiplexing, clock settings, and peripherals) and add DAVE Apps as required by your application.
3. Click on **DAVE – Generate Code**. You will be informed about the progress of the code generation.
4. Having finished, you will see the generated GPDSC file in the **C/C++ Projects** window of DAVE:



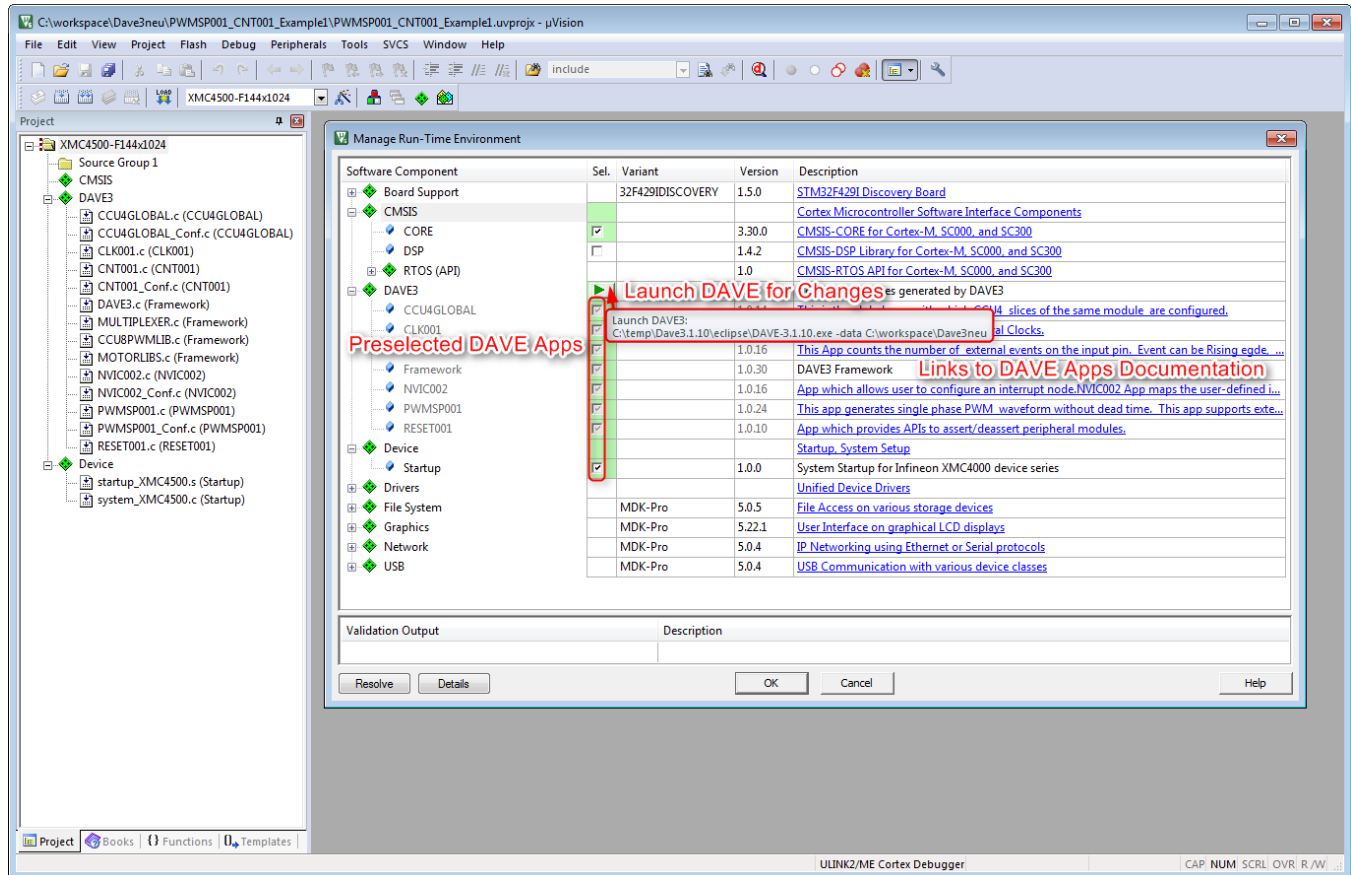
5. Double-click on the GPDSC file. μ Vision will open and create a project file (*.uvprojx) in the directory using the same base name. The GPDSC file will be added to the project file. This ensures that any changes in the DAVE project will be reflected in the μ Vision project automatically. You may now safely close DAVE3.

Work with MDK Version 5

In μ Vision's **Project** window, you will see all software components from DAVE (configuration, examples, and Apps) below the new Cclass called DAVE3. The necessary startup and system files for the selected XMC device are also added (they are part of the Infineon XMC Device Family Pack).

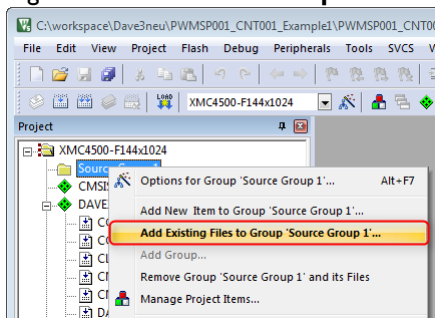
If you open the **Manage Run-Time Environment** window (**Project – Manage – Run-Time Environment...**), you will see the same structure. The different DAVE components cannot be selected individually. This is to make sure that they stay under the control of DAVE. Nevertheless, you can add other software components to the project as you wish. The blue links in the Description column will open a web browser with the documentation for the respective DAVE App.

Using the green **Play button** next to DAVE3, you can go back to DAVE and make necessary changes. After re-generating the code in DAVE, the GPDSC file will be re-read by μ Vision and all changes will be reflected in your project automatically.

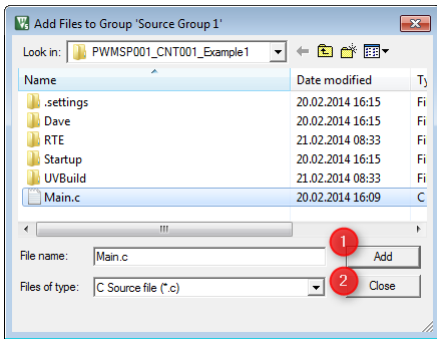


You still need to add a main.c file. If you wish to use the one generated by DAVE, you can add it to the project easily:

1. Right-click on **Source Group 1** and select **Add Existing Files to Group "Source Group 1"...**



2. A new window opens and you can select the **Main.c** file. Click first **Add** and then **Close**. The file is now added to your project.

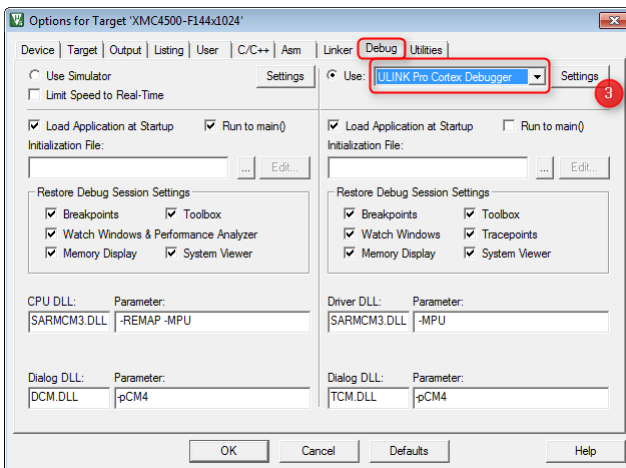


Before building the project and downloading it into the target, you need to configure the debug adapter and the Flash download settings.

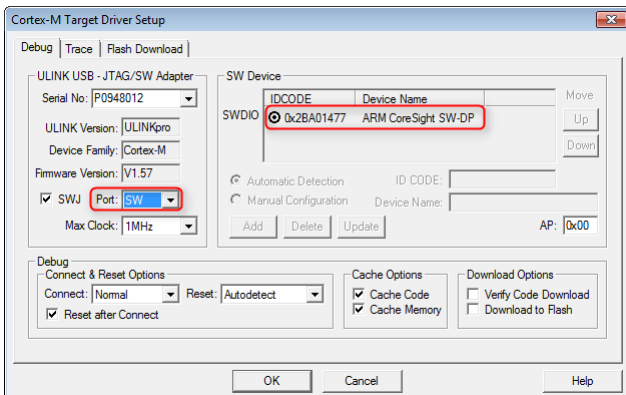
Configure Flash Download Options

The application can be downloaded into Flash using the Download button in μ Vision. First, you need to create a Flash Download Configuration.

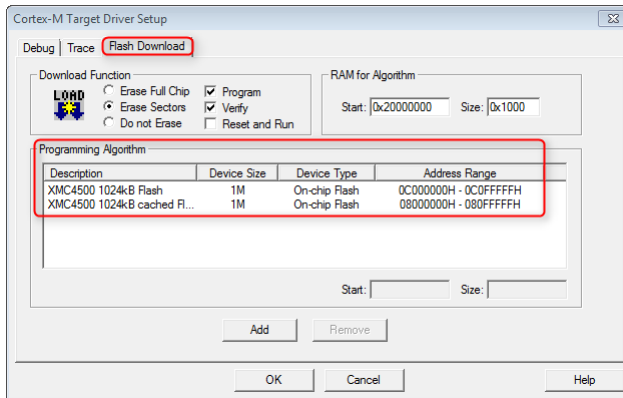
1. Select **Project – Options for Target**.
2. Click on the **Debug** tab and select an appropriate debugger (for XMC1000 based development kits use J-LINK). In this example, we use the **ULINK Pro Cortex Debugger**.
3. Click on Settings.



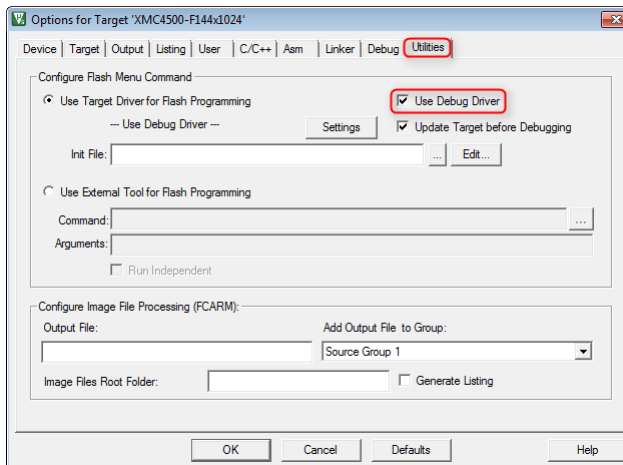
4. In the **Cortex-M Target Driver Setup** window select the **Port** that is used for debugging. In this case Serial Wire (**SW**) is used. The SW Device shows the IDCODE and Device Name automatically. This indicates if you have selected the right port and device.



- Click on the **Flash Download** tab. Verify that an appropriate programming algorithm is selected. If not, use the **Add** button to add a Flash programming algorithm for your device. When finished, click **OK**.



- Make sure that the debug driver is used for Flash programming. Click on the **Utilities** tab and check if **Use Debug Driver** is enabled. Click **OK**.



Build the Project and Download it to Flash

Finally, you can build the project, download it to Flash and run it on the target device.

- Click on **Project – Build Target**.
- Click on **Flash – Download**.
- Press the RESET button on the target board. Your application will start.

If you want to know more about debugging and tracing of the program execution, please refer to the MDK Version 5 website on www.keil.com/mdk5, where you can download the latest **Getting Started** guide.

Conclusion

The new Software Pack concept of MDK Version 5 enables an easy workflow with DAVE and μ Vision. Changing the project in DAVE will be reflected in μ Vision automatically. This enables the developer to create applications on XMC devices using DAVE and MDK Version 5 much faster.

For the XMC1000 family there is a free version of MDK Version 5 available for download. Please visit www.keil.com/infineon/mdk for further details.

Revision History

- February 2014: Initial Version