## imall

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## XMC1200 Boot Kit Getting Started





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## Kit Overview (1/2)

- > XMC1200 Boot Kit
  - Consists of an XMC1200 CPU Card
  - Supported Application Card examples: Colour LED Card, White LED Card

(Application Cards are orderable separately or as part of another Application Kit)





White LED Card



## Kit Overview (2/2)

#### > XMC1200 CPU Card



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#### Hardware Overview



- > Connect XMC1200 CPU Card to PC via USB cable
- > CPU Card is powered up (as indicated by LED on the card)





 Note: Supported Application Card may be additionally connected to the CPU card

#### Tooling Overview – Boot Modes



- > Boot Modes available
  - UART Bootstrap-Loader Mode
  - User Mode (Halt After Reset)
  - User Mode (Debug) Default Mode of device on Boot Kit
  - User Mode (Productive)
- > Boot Modes can be configured via:
  - DAVE<sup>™</sup>
    - Download DAVE<sup>™</sup>

DAVE<sup>™</sup> v4.1.2 download

- MemTool
  - Download MemTool

MemTool v4.65.exe download

 For more information on how to configure the BMI value, please refer to the XMC1000 Tooling Guide.



# Tooling Overview – DAVE<sup>TM</sup> (1/5)



> DAVE<sup>™</sup> download package is available at:

http://infineon-community.com/LP=400



Please register to download DAVE™ version 4 and DAVE™ SDK version 4.

DAVE TM version 4 and DAVE SDK version 4 is now available as productive version. The current versions are: DAVE TM v4.1.2 and DAVE TM SDK v4.1.2.

After registration you will receive a confirmation email with a link to the download-page. With a click on the link you can download a zip file that contains a setup exe-file and a PDF-file with installation instructions. Please check the JUNK or SPAM folder of your mail server if you don't receive a confirmation email.

First Name*		
Last Name*		
Email Address*		
Country*	Please select	~
Company*		
Business Phone		
Target Application	please select	~



#### Tooling Overview – DAVE<sup>™</sup> (2/5)

- > After registration, download and unzip the installer package
- Run DAVE-4.1.2-Setup.exe to install
   DAVE<sup>™</sup> IDE and SEGGER J-Link drivers
- > Open DAVE<sup>™</sup>



- > Update DAVE<sup>™</sup> and DAVE<sup>™</sup> libraries
  - Help  $\rightarrow$  Check for Updates
  - Help  $\rightarrow$  Check for DAVE APP Updates







### Tooling Overview – DAVE<sup>™</sup> (3/5)



- > Install DAVE<sup>TM</sup> APPs libraries and Device Description
  - Help → Install DAVE APP/Example/Device Library

Window	Help		
(÷ • •		Welcome	
	?	Help Contents	
	82	Search	
		Dynamic Help	
		Key Assist	Ctrl+Shift+L
		Tips and Tricks	
		DAVE <sup>™</sup> Forum	
		DAVE <sup>™</sup> News	
		Send Feedback Mail	
		Cheat Sheets	
	2	Install DAVE APP/Example/Device Library	]
		Check for DAVE APP Updates	
		Uninstall DAVE APP/Example/Device Library	
	ay -	Check for Updates	
	₽.	Install New Software	
	۲	Installation Details	
	-	About DAVE™	

 Note: You may skip the above step if you are not using DAVE<sup>™</sup> APPs

#### Tooling Overview – DAVE<sup>™</sup> (4/5)



> Select DAVE Apps Library Manager in the drop-down menu

is wizard page helps in downloading the libra	ries of type example projects or apps library	
ave Site		
Nork with : DAVE Apps Library Manager		✓ Add
	Find more library by working with the Library Update	Sites preferences
ibraries		
inter the keywords to filter :		
		line on a little
Name	Version	Path
Name	Version	Path
Name  DeVICE_PACK  DeVICE_VACK  DeviceDescriptions  DAVE APPs	Version	Path
Name	Version	Path •
Name      Name	Version	Path ,
Name	Version	Path ,
Name	Version	Path ,

- Select DEVICE\_PACK, Library\_DAVEDeviceDescriptions (XMC1200 Device) and DAVE APPs
  - DEVICE\_PACK
  - V Library\_DAVEDeviceDescriptions
  - DAVE APPs

#### Tooling Overview – DAVE<sup>™</sup> (5/5)



> Accept terms of the license agreements and click Finish



> DAVE<sup>™</sup> APPs libraries and Device Description are installed

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## Getting Started – Example – Blinky based on XMC Lib (1/6)



1. Open DAVE<sup>™</sup>



- Create a new "Simple Main" project:
  - File →New →DAVE Project
  - Enter project name e.g. "XMC1200\_Blinky"
  - Select "Simple Main Project" as Project Type



#### 3. Select the device accordingly

Ilicrocontroller Selection Page Select the microcontroller for which the project has to be created XMC1100 Series XMC1200 Series XMC1202-Q040x0032 XMC1202-Q040x0032 XMC1202-T028x0064 XMC1202-T028x0064 XMC1202-T028x0016 XMC1202-Q024x0016 XMC1202-Q024x0016 XMC1202-Q024x0016 XMC1202-T016x00016 XMC1202-T016x0016 XMC1202-T016	
Select the microcontroller for which the project has to be created	
XMC1100 Series         XMC1200 Series         XMC1202-0040x0032         XMC1202-Q040x0016         XMC1202-1028x0064         XMC1202-024x0032         XMC1202-024x0032         XMC1202-024x0032         XMC1202-024x0032         XMC1202-024x0016         XMC1202-024x0016     <	
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Y XMC1200-T038x0200         XMC1202-Q040x0032         XMC1202-Q040x0016         XMC1202-T028x0064         XMC1202-T028x0032         XMC1202-T028x0016         XMC1202-T028x0032         XMC1202-Q024x0032         XMC1202-Q024x0032         XMC1202-T016x0032         XMC1202-T016x0032         XMC1202-T016x0016         Microcontroller Features         Package= TSSOP38         ROM= 200 KB Flash         RAM= 16 KB RAM         InOut= 34 digital I/O         ADC= 12 ADC Channels, 12-bit, Analog-to-Digital Converter         Linker Option	
XMC1202-Q040x0032 XMC1202-Q040x0016 XMC1202-T028x0064 XMC1202-T028x0032 XMC1202-T028x0016 XMC1202-Q024x0032 XMC1202-Q024x0016 XMC1202-T016x0016 XMC1202-T028x	
XMC1202-Q040x0016         XMC1202-T028x0064         XMC1202-T028x0032         XMC1202-T028x0016         XMC1202-Q024x0032         XMC1202-Q024x0016         XMC1202-T016x0032         XMC1202-T016x0032 <t< td=""><td></td></t<>	
XMC1202-T028x0064         XMC1202-T028x0032         XMC1202-T028x0016         XMC1202-Q024x0032         XMC1202-T016x0032         XMC1202-T016x0032 <t< td=""><td></td></t<>	
XMC1202-T028x0032 XMC1202-T028x0016 XMC1202-Q024x0032 XMC1202-Q024x0016 XMC1202-T016x0032 XMC1202-T016x0016 Microcontroller Features Package= TSSOP38 ROM= 200 KB Flash RAM= 16 KB RAM InOut= 34 digital I/O ADC= 12 ADC Channels, 12-bit, Analog-to-Digital Converter Linker Option	
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Linker Option	
Remove unused sections	
Runtime Library	
Library Newlib-nano	
Add floating point support for printf	
Add flasting point support for scanf	
Aud noaling point support for scant	

## Getting Started – Example – Blinky based on XMC Lib (2/6)



- > For this project, we will use
  - System clock frequency of 8MHz
  - LED on Port pin 0.0
  - System timer, SysTick, as the time base for interrupt
- > Next, we will show you how to
  - 1. Set up the System or Main Clock (MCLK)
  - 2. Configure Port pin
  - 3. Configure SysTick and define its exception service routine

## Getting Started – Example – Blinky based on XMC Lib (3/6)



- 1. Set up System or Main Clock (MCLK) using XMCLib
  - Include the header files required for MCLK and GPIO configuration

```
#include "xmc_gpio.h"
#include "xmc_scu.h"
```

 MCLK configured via **IDIV** and **FDIV** bit fields in XMC\_SCU\_CLOCK\_CONFIG data structure

```
XMC_SCU_CLOCK_CONFIG_t clock_config =
{
    .pclk_src = XMC_SCU_CLOCK_PCLKSRC_DOUBLE_MCLK, /*PCLK = 2*MCLK*/
    .rtc_src = XMC_SCU_CLOCK_RTCCLKSRC_DCO2,
    .fdiv = 0, /**< Fractional divider */
    .idiv = 4, /**MCLK = 8MHz */
};</pre>
```

- Initializes clock generators and clock tree in Main.c

```
int main(void)
{
   /* Ensure clock frequency is set at 8MHz (MCLK) */
    XMC_SCU_CLOCK_Init(&clock_config);
```

Getting Started – Example – Blinky based on XMC Lib (4/6)



- 2. Configure Port pin
  - GPIO to toggle the LED is configured via mode and output\_level of XMC\_GPIOC\_CONFIG structure.

```
XMC_GPIO_CONFIG_t gpio_output_config =
{
    .mode = XMC_GPIO_MODE_OUTPUT_PUSH_PULL,
    .output_level = XMC_GPIO_OUTPUT_LEVEL_HIGH,
};
```

- Initializes port pin P0.0 as general purpose output pin in Main.c

```
/* Initialise P0.0 as an output pin */
    XMC_GPI0_Init(LED1, &gpio_output_config);
```

## Getting Started – Example – Blinky based on XMC Lib (5/6)



- 3. Configure SysTick and define its exception service routine
  - SysTick exception handler is defined in **startup\_XMC1200.s**

```
/* ----- */
.globl SysTick_Veneer
SysTick_Veneer:
LDR R0, =SysTick_Handler
MOV PC,R0
/* ----- */
```

- Initialize the SysTick in Main.c

```
/* System timer configuration */
   SysTick_Config(SystemCoreClock / TICKS_PER_SECOND);
```

Define the SysTick exception handler routine in Main.c
 void SysTick\_Handler(void)

```
{
  static uint32_t ticks = 0;
  ticks++;
  if (ticks == TICKS_WAIT)
  {
    XMC_GPI0_ToggleOutput(LED1);
    ticks = 0;
  }
}
```

## Getting Started – Example – Blinky based on XMC Lib (6/6)



- > Build project
  - 1. Click 🚬
  - 2. Wait for Build to finish

'Invoking: ARM-GCC Print Size'
"C:\DAVEv4\DAVE-4.1.2\eclipse\ARM-GCC-49/bin/arm-none-eabitext data bss dec hex filename
2232 20 1040 3292 cdc XMC1200\_Blinky.elf
'Finished building: XMC1200\_Blinky.siz'

- > Download code
  - 1. Click 🏇
  - 2. Switch to Debug perspective E DAVE IDE S DAVE CE S PinMapping The Debug
  - 3. Click 🕩 to run code
- > LED blinks every 0.2s

