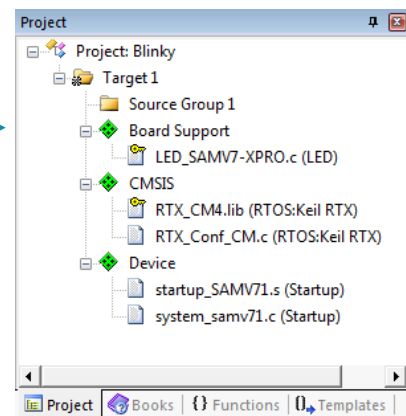


Abstract

This tutorial shows how to create the Blinky project using the Atmel SAMV71 Xplained Ultra development board.

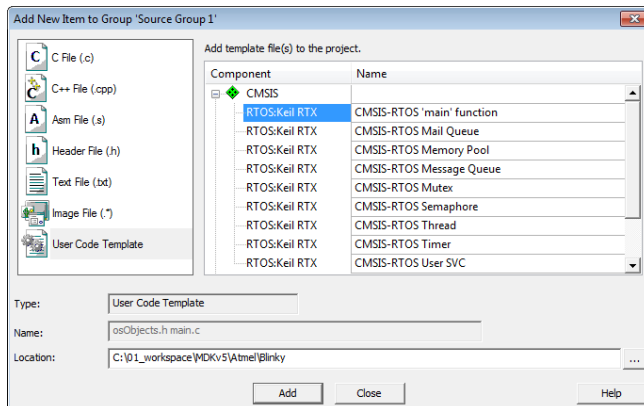
Create a New Project for the Xplained Ultra Board

1. In the main μ Vision menu, select **Project** \rightarrow **New μ Vision Project...**
The 'Create New Project' window opens up.
2. Create a new directory called **Blinky** and enter **Blinky** for the File name. Press **Save**.
3. In the 'Select Device for Target' window select **ATSAMV71Q21** and press **OK**.
4. In the 'Manage Run-Time Environment' window select the following Software Components:
 - a. **CMSIS:RTOS (API):Keil RTX**
 - b. **Board Support:LED (API):LED**
 - c. When done, press **Resolve** and afterwards **OK**.
5. The Project window should look like this



Add user code templates *main.c* and *Thread.c*

6. Right-Click **Source Group 1** and select **Add New Item to Group 'Source Group 1'...**
7. In the upcoming window, select **User Code Template** and then expand **CMSIS**. Select **CMSIS-RTOS 'main' function** and click **Add**:



8. Repeat the process and choose **CMSIS-RTOS Thread**. You now should see a *main.c* and a *Thread.c* file below the Source Group 1.

Configure CMSIS-RTOS RTX

9. Open *RTX_Conf_CM.c*, select the **Configuration Wizard** tab and press **Expand All**.
10. Change the **RTOS Kernel Timer input clock frequency [Hz]** to **30000000** as the Xplained Ultra board runs on 300 MHz.

Configure the Target Options

11. Click on or press **ALT+F7**
12. Select the **Debug** tab and choose **CMSIS-DAP Debugger**. Press **OK**.

Add the Blinky code

13. Change *main.c* as follows:

```
#define osObjectsPublic           // define objects in main module
#include "osObjects.h"          // RTOS object definitions
#include "samv71.h"             // Device header
#include "Board_LED.h"         // ::Board Support:LED

extern int Init_blink_LED (void);

int main (void) {
    osKernelInitialize ();      // initialize CMSIS-RTOS

    LED_Initialize();
    Init_blink_LED();

    osKernelStart ();          // start thread execution
    while(1);
}
```

14. Change *Thread.c* as follows:

```
#include <cmsis_os.h>           // CMSIS RTOS header file
#include "Board_LED.h"         // ::Board Support:LED

void blink_LED (void const *argument); // thread function
osThreadId tid_blink_LED; // thread id
osThreadDef (blink_LED, osPriorityNormal, 1, 0); // thread object

int Init_blink_LED (void) {

    tid_blink_LED = osThreadCreate (osThread(blink_LED), NULL);
    if(!tid_blink_LED) return(-1);

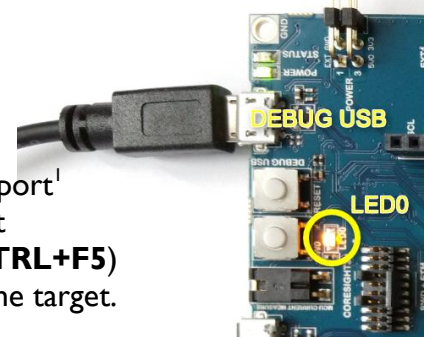
    return(0);
}

void blink_LED (void const *argument) {

    while (1) {
        LED_On (0);
        osDelay(500);
        LED_Off (0);
        osDelay(500);
        osThreadYield();
    }
}
```

Build the Project and run it on the Target

15. Go to **File** → **Save All**
16. Go to **Project** → **Build Target** (or press **F7**)
17. Connect the PC using a Micro-USB cable to **DEBUG USB** port¹
18. Go to **Flash** → **Download** to flash the project to the target
19. Go to **Debug** → **Start/Stop Debug Session** (or press **CTRL+F5**)
20. Go to **Debug** → **Run** (or press **F5**) to run the project on the target.
LED0 will start flashing.



¹ The installation of the USB driver might show an error. This can safely be ignored.