## Abstract

This tutorial shows how to create the Blinky project using the STMicroelectronics STM32F429I-Discovery Kit.

Create a New Project for the Discovery Board

1. In the main μVision menu, select **Project → New μVision 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 **STM32F429ZITx** 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(STM32F429I-Discovery): LED (API):LED**
   c. **Device:STM32Cube Framework (API):Classic**
   d. When done, press **Resolve** and afterwards **OK**.
5. The Project window should look like this
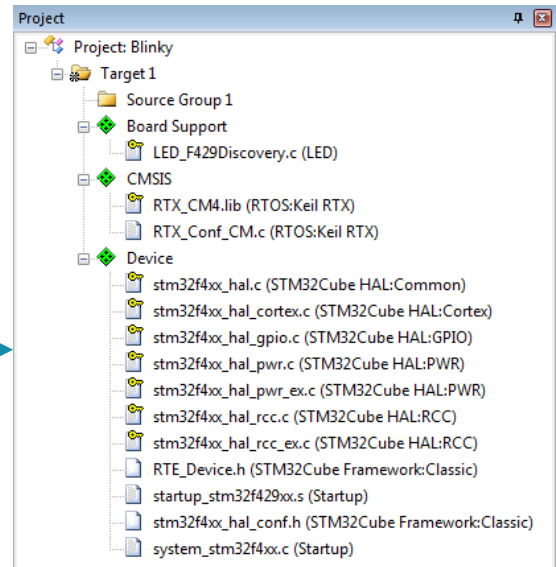
Add user code templates *main.c* and *Thread.c*

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 **Device**. Select **'main' module for STM32Cube** and click **Add**:
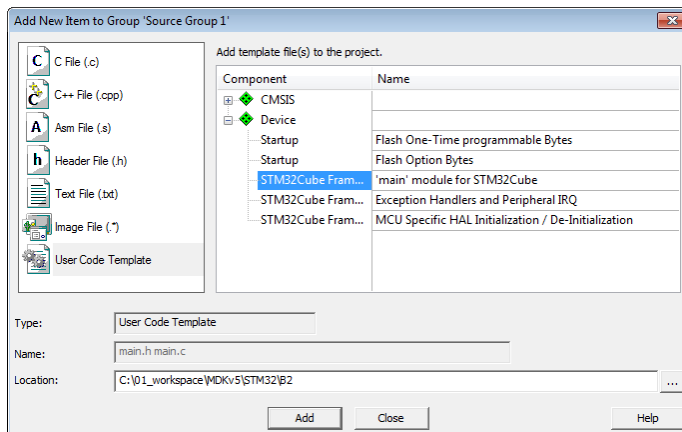
8. Repeat the process, expand **CMSIS** and choose **CMSIS-RTOS Thread**. You now should see a *main.c* and a *Thread.c* file below the Source Group 1.

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 **168000000** as the Discovery kit runs on 168 MHz.

Configure the Target Options

11. Connect the Mini-USB cable to **USB ST-LINK**

12. Click on ![icon] or press **ALT+F7**

13. Select the **Debug** tab and choose **ST-Link Debugger**. Press **Settings**.

14. On the Debug tab, set the **Port** to **SW**. Click **OK** twice.

Add the Blinky code

15. Change *main.c* as follows. After line 44:

```
43    /* Includes ------------------------------------------------------------------*/
44    #include "main.h"
45    #include "stm32f4xx.h"                    // Device header
46    #include "Board_LED.h"                    // ::Board Support:LED
47    extern int Init_blink_LED (void);
```

16. Before line 115 add:

```
115   osKernelInitialize ();                   // initialize CMSIS-RTOS
116   LED_Initialize();
117   Init_blink_LED();
118   osKernelStart ();                        // start thread execution
```

17. 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

18. Go to **File → Save All**
19. Go to **Project → Build Target** (or press **F7**)
20. Go to **Flash → Download** to flash the project to the target
21. Go to **Debug → Start/Stop Debug Session** (or press **CTRL+F5**)
22. Go to **Debug → Run** (or press **F5**) to run the project on the target.
    LED **PG13** will start flashing.