



AN806

MicroBolt

PWM output on the MicroBolt

10/7/2005

**Introduction:**

This application note demonstrates using a PWM output on the MicroBolt.

**Background:**

The MicroBolt contains multiple PWM outputs.

**How it works:**

This ImageCraft ICCARM demo project outputs a varying PWM signal on P0.7 via the PWM2 alternate pin function. Connect an oscilloscope or logic analyzer to the MicroBolt P0.7 pin and view the varying PWM signal as controlled by the demo project. This demonstrates the PWM output via match capability of the MicroBolt.

**Note:**

MR0 is the overall PWM period and MR2 is the register compare value. When the internal PWM counter reaches the MR2 value the output transitions. Therefore, the MR2 value must be less than or equal to the MR0 value for the PWM to function correctly.

**Program Listing:**

```
/*
-----
File Name           : MicroBoltPwmOutput.c
Author              : Micromint, Inc.
Copyright           : Copyright © 2005, Micromint, Inc.
Creation Date       : 4/2/05
Version            : 1.00
Spaces per tab     : 2
Description         : Main C file
Revision           : Initial
-----
*/

/*
-----
Includes
-----
*/

#include <ARM/philips/lpc210x.h>
#include <arm_macros.h>

#include "MicroBoltPwmOutput.h"

/*
-----
Function           : main
Inputs            : None
Outputs           : None
Purpose           : Main function for system
Author            : Micromint, Inc.
-----
*/
```

```

|-----|
*/
void main(void)
{
/*
|-----|
|     MicroBolt hardware setup     |
|-----|
*/

__DISABLE_INTERRUPT();           // Disable all interrupts

SCB_PLLCFG |= 0x23;              // Turn on PLL, set to 59 MHz (0x03 is multiply value of 4)
SCB_PLLCON |= 0x03;
SCB_PLLFEED = 0xAA;             // Shadow register copy for PLL
SCB_PLLFEED = 0x55;

PCB_PINSEL0=0x00000000;         // JTAG is via secondary port
PCB_PINSEL1=0x55400000;
GPIO_IODIR=(0x00000000<<16)|
            0x00000000;

GPIO_IOCLR=0xffffffff;
GPIO_IOSET=(0x00000000<<16)|
            0x00000000;

GPIO_IODIR |= MICROBOLT_LED;    // Setup MicroBolt LED as output

PCB_PINSEL0 |= P0_7_PWM_0_2;    // Setup P0.7 to alternate function PWM0-2

PWM_PR = 0x00000000;           // Load prescaler
PWM_PCR = 0x00000400;          // Select PWM2 as single edge and enable the PWM2 output
PWM_MCR =0x00000000;           // PWM's are free running, no interrupt

PWM_MR0 = 0x00000300;          // Setup Match register 0 count
PWM_MR2 = 0x00000000;          // Setup Match register 2 count

PWM_LER = 0x0000000F;          // Enable shadow copy for match registers
PWM_TCR = 0x00000002;          // Reset counter and prescaler
PWM_TCR = 0x00000009;          // Enable PWM and counter

/*
|-----|
|     Start of application     |
|-----|
*/

while(1)                        // Do this forever
{
    unsigned int Delay;

    for (Delay = 0; Delay < 7750; Delay++); // Delay for 10 mS

    PWM_MR2 = PWM_MR2 + 1;        // Increment PWM2 match value
    PWM_LER = 0x0000000F;        // Latch new MR2 match value

    if (PWM_MR2 >= PWM_MR0)      // PWM match greater than or equal to PWM period?
    {
        PWM_MR2 = 0x00000000;    // Reset match value to 0
        PWM_LER = 0x0000000F;    // Latch new MR2 match value
    }
}
}

```