# Demo Set-up

The SW MC56F84000_PWM_ADC demonstrates ADC and ePWM functionality. The PWMA_SM0 module is in Push-pull configuration and triggers an ADC channel of both the ADC modules. FreeMASTER communicate with a PC Computer using OSBDM via SCI1. It is targeted at MC56F84789 and its derivatives.

## H/W Setup

The h/w consists of:

1. MAPS-MC56F84000 populated with MC56F84789 device

2. USB cable connected to MAPS  OSBDM connector

3. 5V Power supply

Before the demo starts, the HW with OSBDM link needs to be set-up.

## Application SW

The demo s/w is located in a folder MC56F84000_PWM_ADC. The s/w was designed using CodeWarrior CW10.x.

## Development Tools

In order to compile run, load and flash the demo the following steps are necessary:

1. Install CodeWarrior_CW_MCU_v10.x and Run the CodeWarrior

2. Drag and drop < MC56F84000_PWM_ADC\.project  into the opened CodeWarrior CW10.x

3. Clean(if the project is the first time run in your workspace) and Build the application code target MC56F84789_Internal_PFlash_SDM

4. Connect a USB cable between the PC host and the mbed USB port (CN7 on the MAPS-MC56F84000 board)

5. Running/debugging loading the code:

    a. Run As -> Debug Configuration

    b. Set the configuration for debug as download for SDM module.
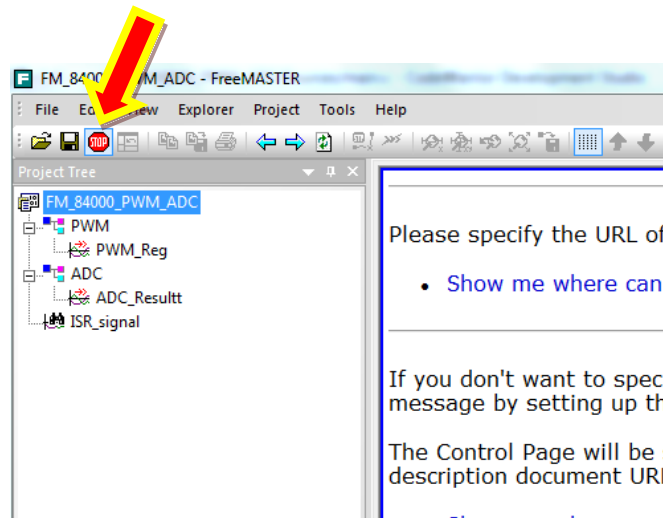
6. Click Debug

7. Start

## Running the demo

Demo is to be controlled using a FreeMASTER communication tool. In order to control the application, the following SW is necessary:
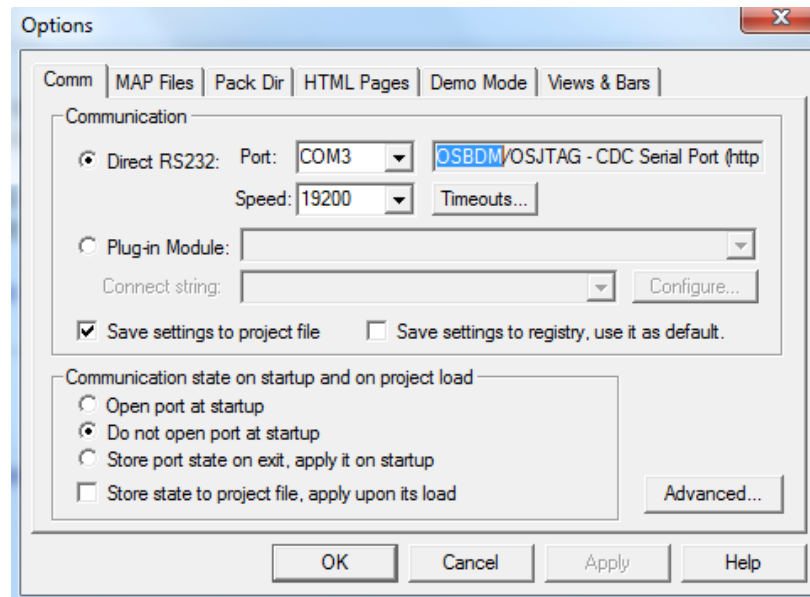
1. FreeMASTER Application Installation
   http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=FREEMASTER&parentCode=null

2. CodeWarrior Connection Server
   this is a part of Freescale CodeWarrior installation, located usually at
   C:\Freescale\CW MCU v10.6\MCU\ccs\bin
   but the ccs_bld000_win.zip can also be obtained without the CodeWarrior installation

The following steps are necessary (if continuing from debug mode, goto step 4 and when freemaster is in run state, terminate the code from CodeWarrior using terminate button):

1. Connect Power Supply

2. Connect OSBDM for FreeMASTER control

3. If the application s/w is not programmed into the MAPS_84000 board, go to section Application SW

4. Install FreeMASTER Application

5. Start FM_84000_PWM_ADC.pmp (FreeMASTER Application must be installed before)

6. If the FreeMASTER is not connected (variables values are: ?), check:

   a. Click at the STOP switch

b. If an error message is generate after STOP switch click, go to to Project/Options Com slider and set the Direct RS232 Port and Speed
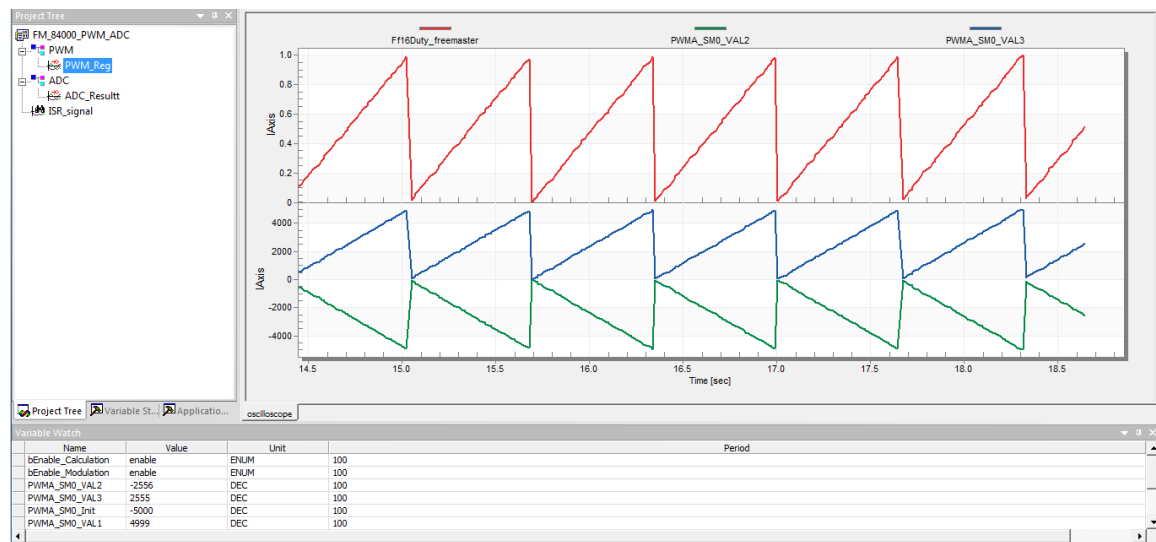


7. Application runs with FreeMASTER.

# FreeMASTER Control

## Modulated PWM signals

You can see and check the duty cycle and PWM value registers variables which are modulated with linear modulation in the FreeMASTER scope:

The PWMs modulation can be switched off with bEnable_Modulation – disable. Then the PWM values are constant.

Other possibility is to set all the PWM value registers manually. At that case, disable bEnable_Calculation – disable and all the  PWM dutycycles are updated manually.

The PWM outputs are available on the pins

PWM_ SM0 with Push-pull configuration center aligned PWM signals

1.  PWMA_0B – pin68

2.  PWMA_0A – pin69

## ADC result signals
In ADC scope, ADC_result0 and ADC_result8 value will reflect the status of ANA0 and ANB0 respectively.

1.  ANA0 – pin22

2.  ANB0 – pin33