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Flexis™ Series

# Flexis™ Series—8-bit and 32-bit Compatible MCUs

For DEMOS08AC16KIT, DEMOS08AC60KIT, DEMOS08AC128KIT, DEMO51AC256KIT, and DEMOACKIT

**Step 1: Install CodeWarrior® for Microcontrollers**

**Step 2: Install PEMicro Demo Board Toolkit**

**Step 3: Connect Board to Computer**

**Step 4: Test Board by Running Quick Start Application**



# Get to Know the Flexis™ Board

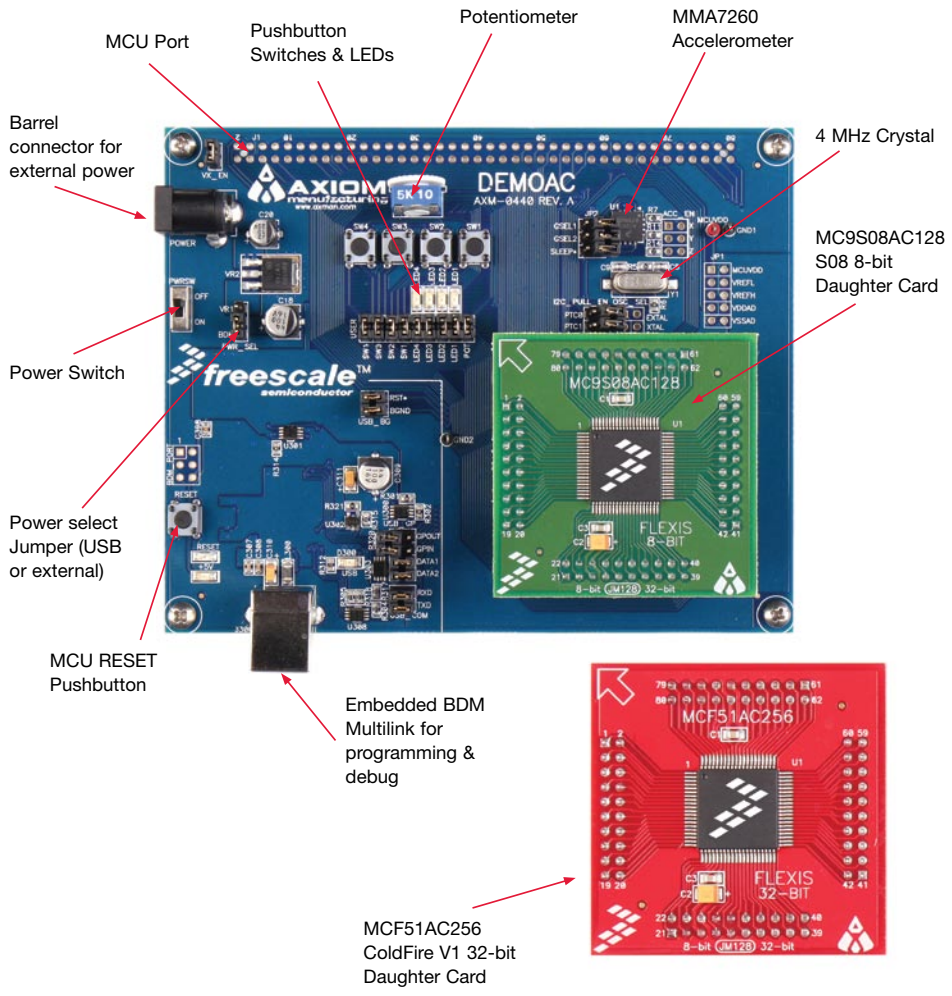


Figure 1. DEMOAC baseboard with 8-bit and 32-bit daughter cards.

# Introduction

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DEMOAC is a cost-effective board targeting quick microcontroller evaluation. The DEMOAC board comes in several versions depending on the target AC family MCU:

- DEMOS08AC16KIT
- DEMOS08AC60KIT
- DEMOS08AC128KIT
- DEMO51AC256KIT
- DEMOACKIT which includes both the MC9S08AC128 and MCF51AC256

This quick start guide applies to all versions.

This quick start guide is designed to get you ready to develop your application on the AC family device within minutes. Please take a look at the DEMOAC Labs document for your device to learn more about the key benefits that AC family gives your application.

# Step-by-Step Installation Instructions

## STEP 1

### Install CodeWarrior® for Microcontrollers

CodeWarrior is a powerful tool designed to help you minimize your time to market. CodeWarrior installation is a one-time required step before connecting the board to your computer.

1. Insert provided DVD into computer and a menu will appear using your default browser.
2. Click on the icon to download CodeWarrior installer. This will prompt you to save file CW\_MCU\_V6\_1.exe to your computer.
3. Once the download is completed, double-click the executable file to run installation.
4. Follow the on-screen instructions until installation is complete. Once installation is complete, take advantage of several CodeWarrior tutorials that will walk you through various development tool features, such as “C Programming,” “Assembly Programming,” “Using Processor Expert,” and more. Simply open CodeWarrior via the “Programs>Freescale CodeWarrior>CW for Microcontroller V6.1>CodeWarrior IDE.exe” path. Click “Run Getting Started Tutorial” from the startup dialog, select a tutorial and follow the on-screen instructions.
5. Click on the icon to download the MC9S08AC128 CW6.1 Service Pack installer. This will prompt you to save file CW08\_V6\_1\_HCS08\_AC128\_SP.exe to your computer.
6. Once the download is completed, double-click the executable file to run installation. Follow the on-screen instructions until installation is complete.
7. Click on the icon to download the MCF51AC256 CW6.1 Service Pack installer. This will prompt you to save file CW08\_V6\_1\_CV1\_AC256\_SP.exe to your computer.

8. Once the download is completed, double-click the executable file to run installation. Follow the on-screen instructions until installation is complete.
9. Click on the icon to download the Processor Expert Update installer. This will prompt you to save file CW08\_V6\_1\_PE\_V3\_03\_SP.exe to your computer.
10. Once the download is completed, double-click the executable file to run installation. Follow the on-screen instructions until installation is complete.

## STEP 2

### Install PEMicro Demo Board Toolkit

The PEMicro Demo Board Toolkit install is a one-time required step. The Demo Board Toolkit includes graphical utilities that run on your computer and help speed up your development. These utilities take development beyond the hardware and interact with the target microcontroller over the same USB multilink reference design on the board that allows you to debug using CodeWarrior. Best of all, you can debug your microcontroller in CodeWarrior while simultaneously using one of the following utilities: Logic Analyzer, Serial Grapher, Terminal Window and Accelerometer Demo Grapher.

1. Insert provided DVD into computer and a menu will appear using your default browser.
2. Click on “DEMOAC” then click on “Other DEMOAC Resources” in the navigation panel on left-side of the DVD menu. This will launch the P&E DEMOAC Resources menu.

3. From new menu, click on “Drivers & PEMicro Demo Board Toolkit”. This will launch the appropriate menu for downloading toolkit.
  4. From new menu, click on “PEMicro Demo Board Toolkit.” This will prompt you to save the file “Embedded\_Multilink\_Toolkit.zip” to your computer.
  5. Extract zip file to desired location on your computer. This will create a “pemicro/toolkit” folder that includes all graphical utilities.
4. Operating system will recognize your board as new hardware and will prompt you to install the USB drivers. Choose recommended option to install the software automatically. USB drivers for your board were pre-loaded in CodeWarrior installation.
  5. Follow on-screen instructions until all USB driver installations are complete. The green USB LED on-board should illuminate.

For more information on the Demo Board Toolkit read the board user manual (DEMOAC\_UM.pdf) on [www.freescale.com/flexis](http://www.freescale.com/flexis) or on the DVD under Documentation > Development System Documentation > DEMOAC User Manual of the DVD menu. For new and upgraded utilities to the Demo Board Toolkit, visit <http://www.pemicro.com/>



### STEP 3

## Connect Board to Computer

USB driver installation is a one-time required step, to be completed after CodeWarrior installation.

1. Remove board from anti-static pouch. The appropriate daughter card for your kit will be mounted on the base board.
2. If your daughter card was purchased separately from the DEMOAC board, remove the existing daughter card from the DEMOAC board if necessary and install the new daughter card at connector JM1 – JM4. Ensure the module is properly oriented and fully seated.
3. Connect the provided USB cable to a free USB port on your computer and then to the USB connector on the board.



### STEP 4

## Test by Running the Quick Start Application

Now that you have successfully completed the software and hardware setup, test your board by running the Quick Start Application pre-loaded in the microcontroller’s on-chip flash memory.

The programmed application samples keyboard input pins connected to push buttons. Each push button press lights the associated LED with a pulse-width modulated signal. The application also samples the potentiometer using the microcontroller’s analog-to-digital converter and uses the result to select one of the four LEDs.

1. Turn the PWRSW switch to the ON position. The green +5V LED will illuminate and application will start.
2. Press push buttons labeled SW1, SW2, SW3 and SW4. The associated LED at LED1, LED2, LED3 or LED4 will blink while the button is pressed. Each LED is driven by a pulse-width modulated signal.
3. Rotate the potentiometer RV1 clockwise and counter-clockwise. As the potentiometer is rotated, LEDs 1-4 will light sequentially.

## Additional PEMicro Demo Board Toolkit Applications

In addition to the Quick Start Application, the DEMOAC Resources on the Breaking Bit Boundaries DVD-ROM features other toolkit applications that work with the DEMOAC board. One such application is the accelerometer demo.

### Accelerometer Demo Application

This graphing application will graph data from the virtual serial port on the DEMOAC board. The state of the on-board three-axis accelerometer is sampled by the microcontroller-based serial accelerometer demonstration code using on-chip A/D converter channels. This data is converted into ASCII characters and sent out the virtual serial port of the DEMOAC board. The data is then graphed by the PC-based graphing application for the user to view. This application may be used to graph any data as long as the data is formatted properly.

All of the P&E toolkit applications were installed in step 2. The MCU accelerometer demonstration code is included with the MCF51AC256 CW6.1 Service Pack and may also be downloaded from the Axiom Manufacturing web site at <http://www.axman.com/support>.

### Virtual Serial Port

The DEMOAC board also has the capability of implementing a virtual serial port on the PC. This allows the PC to send and receive serial data via the serial communication pins of the embedded Multilink design. Using jumpers RXD and TXD, this virtual serial port may be configured to connect the SCI port on the AC family processors to several utilities in the P&E Embedded Multilink Toolkit.

## MCU Port Connector Pinout

The following is the pinout for the MCU port connector on the DEMOAC board. Please note that not all AC family daughter cards will use all 80 pins in the MCU port connector and the pin names may vary slightly between the AC family MCUs. Refer to the schematic for the AC MCU daughter card for the detailed connections.

VDD	1	2	IR0/TPMCLK
VSS	3	4	RESET
PTE0/RGPI00/TxD1	5	6	BKGD/MS
PTE1/RGPI01/RxD1	7	8	PTD6/FTM1CLK/AD1P14
PTG0/KBI1P0	9	10	VREFH
PTG1/KBI1P1	11	12	VREFL
PTG2/RGPI02/FTM1CH0	13	14	PTD0/AD1P8/ACMP1+
PTG3/RGPI02/FTM1CH1	15	16	PTD1/AD1P9/ACMP1-
PTG6/RGPI06/MOSI1	17	18	PTB3/AD1P3
PTG5/RGPI05/MISO1	19	20	PTB2/AD1P2
PTE7/RGPI07/SPCK1	21	22	PTB0/TPM3CH0/AD1P0
PTE4/RGPI04/SS1	23	24	PTB1/TPM3CH1/AD1P1
PTD2 / KBI1P5 / AD1P10 / ACMP10	25	26	PTA0 / TxCAN
PTD3 / KBI1P6 / AD1P11	27	28	PTA1 / RxCAN
PTG2 / KBI1P2	29	30	PTH5 / MOSI2
PTG3 / KBI1P3 / AD1P18	31	32	PTH6 / MISO2
PTF0 / RGPI08 / FTM1CH2	33	34	PTH4 / SPCK2
PTF1 / RGPI09 / FTM1CH3	35	36	PTC4 / SS2
PTF4 / RGPI012 / FTM2CH0	37	38	PTC3 / TxD2
PTF5 / RGPI013 / FTM2CH1	39	40	PTC5 / RxD2
PTF2 / RGPI010 / FTM1CH4	41	42	PTC0 / SCL1
PTF3 / RGPI011 / FTM1CH5	43	44	PTC1 / SDA1
PTF6 / RGPI014 / FTM1FLT	45	46	PTC2 / MCLK
PTF7 / RGPI015	47	48	PTC6/FTM2FLT
PTB4/AD1P4	49	50	PTA2
PTB5/AD1P5	51	52	PTA3 / ACMP20
PTB6/AD1P6	53	54	PTA4 / ACMP2-
PTB7/AD1P7	55	56	PTA5 / ACMP2+
PTD4/FTM2CLK/ADP12	57	58	PTA6/AD1P16
PTD5/ADP13	59	60	PTA7/AD1P17
PTD6/FTM1CLK/ADP14	61	62	PTG5/XTAL
PTD7/KBI1P7/ADP15	63	64	PTG6/EXTAL
VDDA	65	66	PTJ0/PST0
VSSA	67	68	PTJ1/PST1
PTG4/KBI1P4/AD1P19	69	70	PTJ2/PST2
n/c	71	72	PTJ3/PST3
PTH0/FTM2CH2/AD1P20	73	74	PTJ4/DDATA0
PTH1/FTM2CH3/PSTCLK0/AD1P21	75	76	PTJ5/DDATA1
PTH2/FTM2CH4/PSTCLK1/AD1P22	77	78	PTJ6/DDATA2
PTH3/FTM2CH5/BKPT/AD1P23	79	80	PTJ7/DDATA3

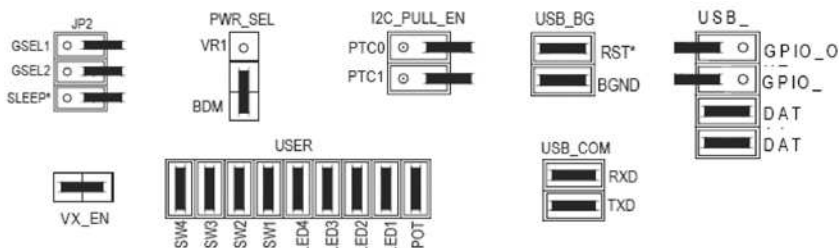




# Quick Board References

## Default Jumper Settings

The default jumper settings for the DEMOAC board are shown below.



Jumper	Default Settings
VX_EN	ON
PWR_SEL	Set to BDM
USER	All ON
JP2	All OFF
I2C_PULL_EN	All OFF
USB_BG	All ON
GP_IN	OFF
GP_OUT	OFF
DATA1	ON
DATA2	ON
RXD	ON
TXD	ON

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