

1 Introduction

Thank you for your interest in the PE0403-734x and EV9942E Evaluation Boards.

This quick start guide will help you get started with PE0403-734X and EV9942E evaluation using the analogue Function Image™ (FI). The respective datasheets and user manuals provide extensive information, but this “quick start” guide consolidates information from multiple sources to accelerate your testing.

This guide walks the user through the following steps:

- Downloading necessary files
- Connecting the PE0403-734x, EV9942E, and PE0003
- Installing PE0003 USB driver
- Using PE0003 graphical user interface (GUI) to:
 - Download the Function Image™ to CMX7341
 - Execute script that performs analogue FM demodulation of 448MHz signal

This guide helps the user perform the following test:

- RF signal generator frequency modulates a 448MHz carrier signal (modulating signal can be voice or tones)
- 448MHz RF FM signal applied to the CMX994E LNA input
- CMX994E converts the RF FM signal to baseband IQ signals that are passed to the CMX7341
- CMX7341 demodulates the analogue FM IQ baseband signals and passes the recovered voice to an external speaker

2 History

Version	Changes	Date
1	Initial release	15-12-01

Table of Contents

1	Introduction	1
2	History	1
3	Preparation for Operation	2
3.1	Documents and Software	2
3.2	Test Equipment and Materials	2
3.3	Basic Connections	2
4	PE0003 Installation and Graphical User Interface	4
5	Function Image™ Loading	4
6	Voice Test.....	5
6.1	Helpful Hints.....	5

3 Preparation for Operation

3.1 Documents and Software

Please visit the CML website (www.cmlmicro.com) and download the following files:

- PE0003 User Manual
- PE0003 Evaluation Software
- EV9942E User Manual
- EV9942E Schematics
- CMX994/CMX994A/CMX994E Datasheet
- PE0403 Datasheet
- PE0403-734x Board Schematics
- Script file “CMX7341_CMX994E_AnalogueFM_Rx.pes”

Please visit the CML Technical Portal and download the following files (contact your CML representative if you have difficulty accessing these files):

- CMX7341 Datasheet/User Manual
- CMX7341 Function Image™ for “dPMR + Analogue” operation (i.e. 7341FI-1.x)
- CMX7341 Activation Code (for “EvKit”)

3.2 Test Equipment and Materials

The following test equipment and materials are needed for this test:

- PC with Windows 8 or earlier
- +/-5V supply for PE0003 and PE0403-734x
- +7.2V supply (rated for 1A) for EV9942E
- 448MHz FM signal source (e.g. RF signal generator with voice as modulating input)
- Powered speakers to listen to recovered “voice”
- Oscilloscope (for generic signal viewing if desired)
- 1x USB cable (type A male to mini B male)
- 10-pin ribbon cable (length $\leq$ 8 in)

3.3 Basic Connections

- Connect PE0403-734x “PE0002 C-BUS” (J7) to PE0003 “C-BUS1” (J3)
- Connect EV9942E “C-BUS” (J16) to PE0403-734x “C-BUS Master” (J20)



Figure 1: Assembled Boards without Wires

- Connect +5V to PE0003 (J11)
 - PE0003 also supplies +5V to PE0403-734x via right-angle connector (J4)
- Connect -5V to PE0403-734x “0V” and “-V” connector (J19)
- Connect +7.2V to EV9942E (J12)
- Connect RF signal generator output to EV9942E “LNA_IN” (J5)

- Create a 10-pin ribbon cable and install it between EV9942E J1 and PE0403-734x (J9).
 - Connections are pin1-pin1, pin2-pin2, e.g. direct connection
- Connect powered speakers to PE0403-734x “AUDIO” 3.5mm jack (J1)
 - JP4 shorted – signal applied to tip and ring
 - JP4 open – signal applied to tip only.

The final assembly should look similar to this:

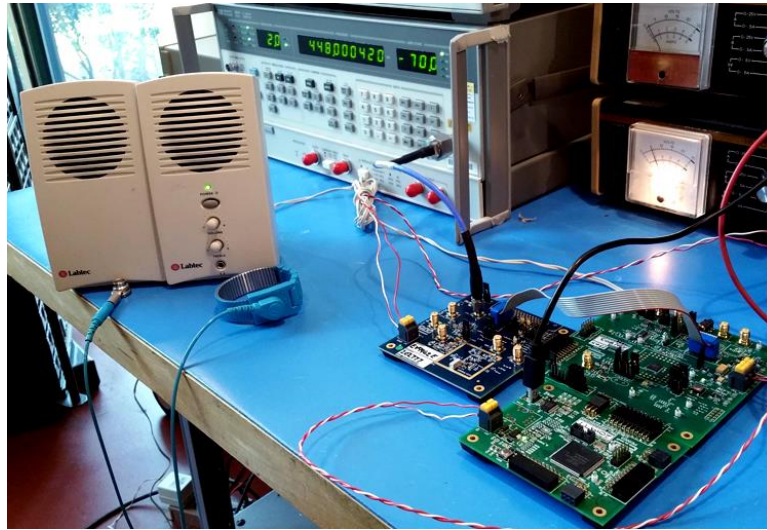


Figure 2: Complete Test Setup



Figure 3: Close-up of Board Connections

4 PE0003 Installation and Graphical User Interface

The following steps will install the PE0003 on your PC:

- Apply power to all boards.
- Connect PE0003 to PC with USB cable.
- The PC will ask for a USB driver the first time a PE0003 is connected. When prompted, load the USB driver from the “Driver” folder of the unzipped PE0003 Evaluation Software package.
 - Your PC may attempt to use “Windows Update” to find the PE0003 USB driver. Cancel the “Windows Update” search. On your PC click the “Start” button, right click on “Computer” and select “Properties”. Select “Device Manager”. Right click “PE0003 Evaluation Kit” and choose “Update driver software”. Choose “Browse my computer” and locate the PE0003 driver you downloaded earlier. Click “Install anyway” if you get a driver warning message.

The PE0003 graphical user interface (GUI) is an executable file located in the PE0003 Evaluation Software package (“ES0003xx.zip”, “xx” is version number). Double-click the executable file to launch the GUI.

5 Function Image™ Loading

The CMX734x is a *FirmASIC*® device that requires a Function Image™ file (FI) to be loaded after power up or device reset. Perform the following steps to load an analogue FI (FI-1.x) into the CMX734x:

- Within the GUI, click “FI Manager” tab.
- Select “PC” as source and “Target C-BUS 1” as destination.
- Click “Browse” and locate/select the CMX734x FI you downloaded earlier.
- Enter the “EvKit” activation code you downloaded earlier.
- Click “Load”. The PE0003 will copy the FI stored on the PC and load it into the CMX734x. A dialogue box will provide additional information about the successful FI load:

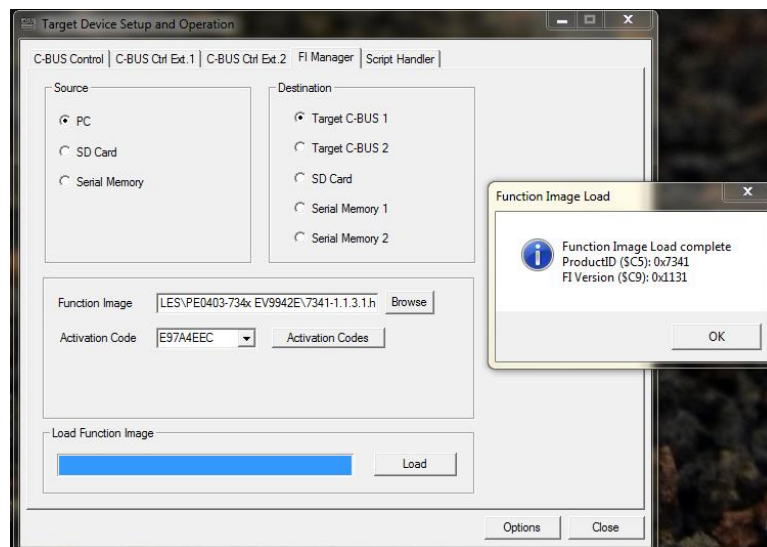


Figure 4: GUI After Successful FI Load

6 Voice Test

A script file has been created to automate CMX7341 and CMX994E register configuration for this test. The script is called “CMX7341_CMX994E_AnalogueFM_Rx.pes” and is available from the CML website.

The script file is loaded into the GUI and executed by the PE0003. The script file is a commented text file that can serve as the basis of your firmware development.

The CMX7341 communicates over its EEPROM interface with CMX994E via C-BUS transactions (EEPROM is not fitted on PE0403-734x). C-BUS signals are transmitted via PE0403-734x “C-BUS Master” connector (J20) to EV9942E “C-BUS” connector (J16). During normal operation the CMX7341 autonomously manages the CMX994E, but the script file includes direct CMX994E register writes to illustrate the process.

- Activate your FM RF signal source and set the output power to -70dBm.
- In the GUI, click the “Script Handler” tab.
- Click the “Select Script” button and locate the “CMX7341_CMX994E_AnalogueFI.pes” script.
- Click “Run”.
- Enable the powered speakers to reproduce the recovered audio.

The information contained in the respective datasheets and user manuals allows for creation of other tests.

6.1 Helpful Hints

Detailed PE0003 driver installation information can be found in the PE0003 User Manual. For Windows 7 and Windows 8 driver signing issues see the FAQ tab on the CML website’s PE0003 Product page.

The PE0003 generates high spurious noise typical of high-speed processors and this may be coupled into other circuits. While every care has been taken to avoid issues, optimum performance will be achieved with a production design that includes overall shielding and consideration of the layout with respect to the processor speed and proximity.

Please contact CML Technical Support if you have any questions or require further assistance.

CML does not assume any responsibility for the use of any algorithms, methods or circuitry described. No IPR or circuit patent licenses are implied. CML reserves the right at any time without notice to change the said algorithms, methods and circuitry and this product specification. CML has a policy of testing every product shipped using calibrated test equipment to ensure compliance with this product specification. Specific testing of all circuit parameters is not necessarily performed.

 CML Microcircuits (UK) Ltd COMMUNICATION SEMICONDUCTORS	 CML Microcircuits (USA) Inc. COMMUNICATION SEMICONDUCTORS	 CML Microcircuits (Singapore) Pte Ltd COMMUNICATION SEMICONDUCTORS
Tel: +44 (0)1621 875500 Fax: +44 (0)1621 875600 Sales: sales@cmlmicro.com Tech Support: techsupport@cmlmicro.com	Tel: +1 336 744 5050 800 638 5577 Fax: +1 336 744 5054 Sales: us.sales@cmlmicro.com Tech Support: us.techsupport@cmlmicro.com	Tel: +65 62 888129 Fax: +65 62 888230 Sales: sg.sales@cmlmicro.com Tech Support: sg.techsupport@cmlmicro.com
- www.cmlmicro.com -		