CML Microcircuits

COMMUNICATION SEMICONDUCTORS

Evaluation Board Quick Start

EV9730

Publication: QS/EV9730/1

1   Introduction

Thank you for your interest in the EV9730 Evaluation Board.

This quick start guide will help you get started with your EV9730 evaluation. The respective datasheet and user manual provide full details on the board, 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 EV9730 and PE0003
- Installing PE0003 USB driver
- Using PE0003 graphical user interface (GUI) to adjust CMX973 settings for modulator and demodulator operation

2   History

Version	Changes	Date
1	Initial release	15-01-26

3   EV9730 Operation

3.1   Download of Documents and Software
Please visit the CML website (www.cmlmicro.com) and download the following files:
- CMX973 Datasheet
- EV9730 User Manual
- EV9730 Schematic
- EV9730 Evaluation Software package
- PE0003 Driver
- PE0003 User Manual

3.2   Test Equipment
The following test equipment will be needed:
- PC with Windows 8 or earlier.
- +5V supply (rated for 300mA) for PE0003 and EV9730.
- RF signal generator
- Baseband IQ signal generator
- RF spectrum analyzer
- Oscilloscope (for generic signal viewing if desired)

3.3   Basic Connections
- Connect EV9730 to "C-BUS1" port on PE0003.
- Apply +5V to PE0003 and EV9730.
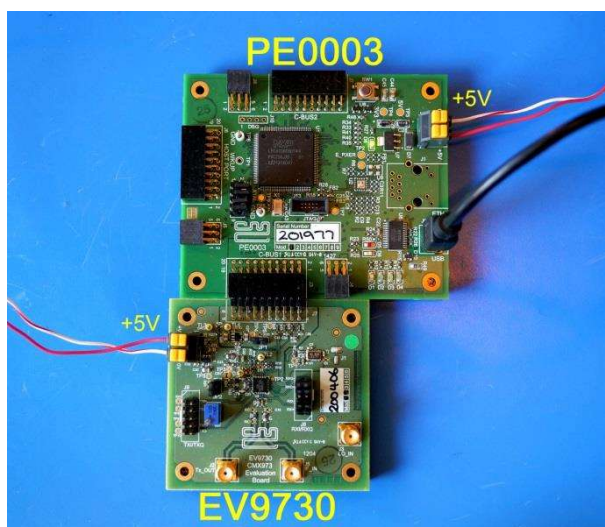
At this point the boards should look like this:

Figure 1: EV9730 and PE0003

3.4   PE0003 Installation

The EV9730 can be controlled with either the PE0003 PC Interface Card or its predecessor, the PE0002. The unzipped EV9730 Evaluation Software package includes software to allow the use of either PC interface card. A "Readme.txt" file indicates which file to use with which PC interface card.

The following steps will install the PE0003 on your PC:
- 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 unzipped PE0003 Driver package.
- Your PC may attempt to use "Windows Update" to find the PE0003 USB driver. Cancel the "Windows Update" search. On your PC click "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.

3.5   EV9730 Graphical User Interface

The EV9730 graphical user interface (GUI), named "ES9730xx.exe", is available in the unzipped software package that corresponds with PE0003. Double-click the executable file and you will be presented with this window:
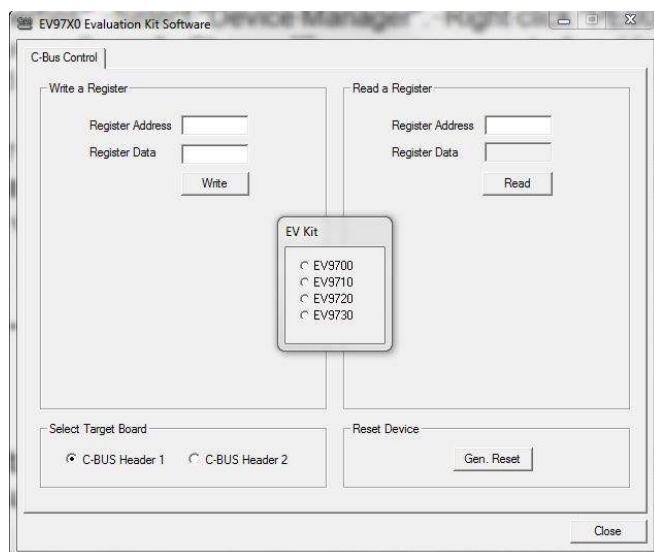

Figure 2: EV9730 GUI Opening Screen

Select EV9730 and click "Gen Reset" button in bottom right corner of GUI.

3.6   Modulator Operation
- Apply 892MHz @ -10dBm to EV9730 LO_IN connector J3.
- Apply baseband IQ inputs, biased at 1.6V, to EV9730 TXI/TXQ header J9.
  o   Input amplitude should be 500mVpk-pk on each of TXI+/TXI- and TXQ+/TXQ-.
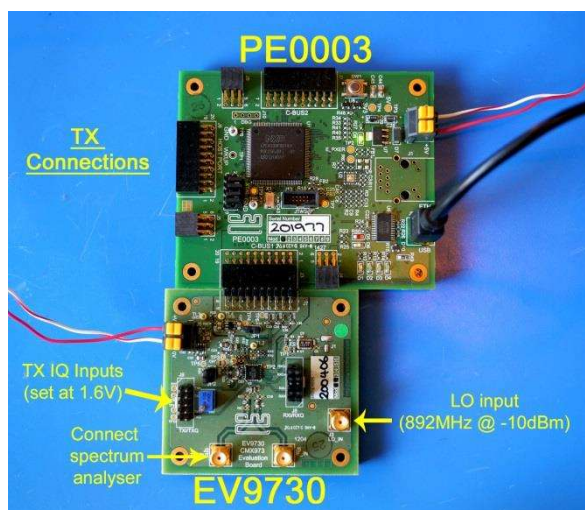- Connect spectrum analyser to Tx_OUT connector J2.

Figure 3:EV9730 Modulator Connections

- Click "Gen Reset" in "C-BUS Control" tab of GUI.
- Setup the "Registers 1" tab as follows, then click "Write All" to apply settings to CMX973:
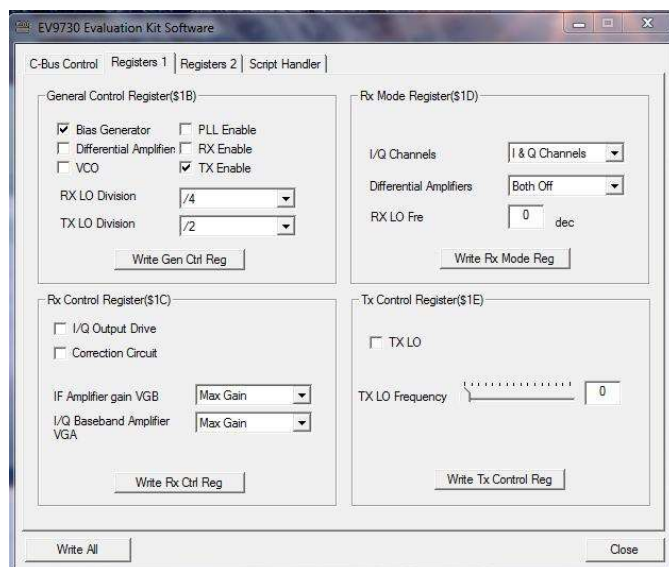

Figure 4: Settings for Modulator Operation

- A 446MHz signal should be present on the spectrum analyser.

3.7   Demodulator Operation
- Apply 180MHz @ -10dBm to EV9730 LO_IN connector J3.
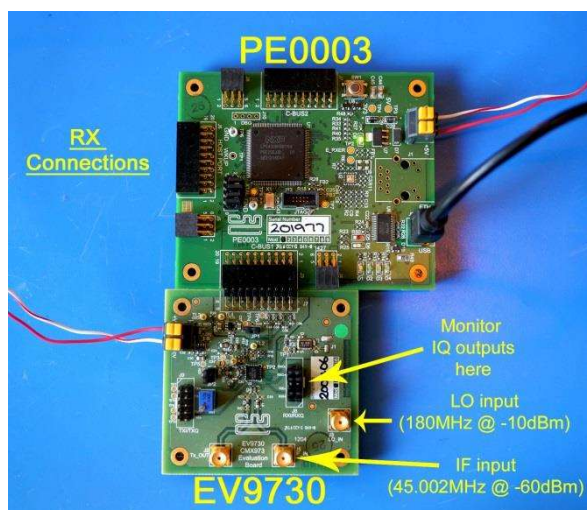- Apply IF signal = 45.002MHz @ -60dBm to EV9730 IF_IN connector J5.

Figure 5:EV9730 Demodulator Connections

- Click "Gen Reset" in "C-BUS Control" tab of GUI.
- Setup the "Registers 1" tab as follows, then click "Write All" to apply settings to CMX973:

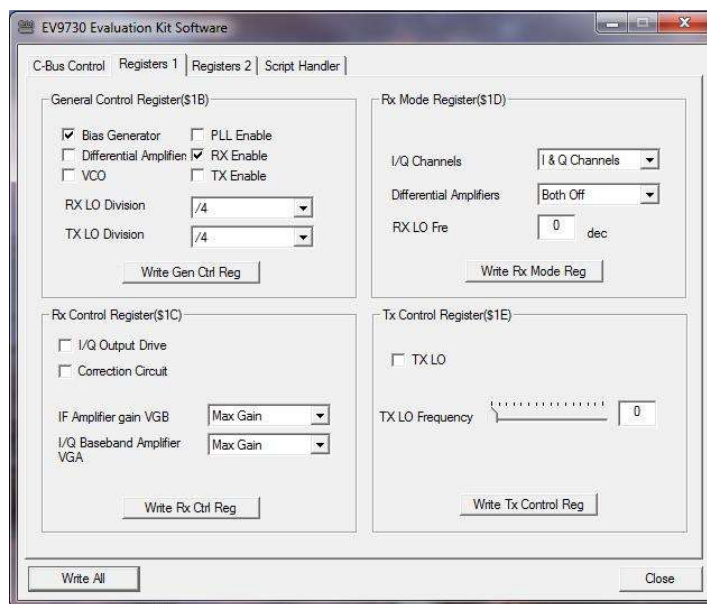**Figure 6:Settings for Demodulator Operation**

- Remove jumpers from EV9730 RXI/RXQ header J8.
- Measure DC voltages on J8 and ensure that:
    - abs(RXI+ - RXI-) < 25mV
    - abs(RXQ+ - RXQ-) < 25mV.
    - If these conditions aren't met, adjust I DC and Q DC sliders in "RX Offset Register ($1F)" area of "Registers 2" tab in GUI.
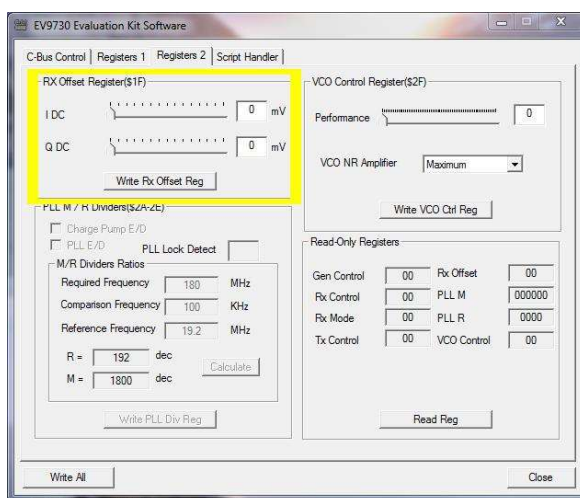

Figure 7: Rx IQ DC Offset Adjustment Area

- EV9730 should now be operating as a receiver with IF=45MHz.

3.8 Helpful Hints

Detailed PE0003 driver installation information can be found in the PE0003 User Manual. For Win7 and Win8 driver signing issues see the FAQ tab on the CML website's PE0003 Product page.

Detailed information on GUI operation can be found in the PE0003 User Manual.

A reference document for the Script language can be downloaded from the CML website's PE0003 product page on the Knowledge Base tab.

Keep a reasonable space between RF evaluation boards to avoid RF coupling issues.

Keep RF leads routed away from the boards and other when making precise measurements. This will avoid signal coupling affecting the results.

The PE0003 generates high spurious noise typical of high speed processors and this may be coupled into the RF 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.

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