Reconfiguration Guide for SOC Modules

System-On-Chip (SOC) Technologies

API Specification

Revision 2.0
2016/09/02

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## Revision History

The following table shows the revision history for this document.

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<td></td>
<td>Old versions</td>
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<tr>
<td>09/02/2016</td>
<td>Added cover page and disclosing</td>
<td>2.0</td>
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1. Product Overview

The SOC MPEG Codec Modules are small all-in-one hardware modules that connect to a user PCB through a standard DDR3 connector for video/audio compression, decompression, and transcoding functions.

![Fig. 1 The SOC MCM-1000x Modules](image)

2. Reprogramming Options

SOC provides updates to enhance and add features to the SOC IP cores embedded in the module. There are two options for reprogramming the SOC Modules. The first option is to temporarily reprogram the modules. This is used to quickly evaluate the core update. The update will be lost when the module is power cycled. This temporary update only takes a few seconds to configure the module. The second option is to reprogram the flash on the module. This method will destroy the current version the module is using. Programming this method can also take up to 30 minutes for some configurations. In either case both methods are fairly similar.

3. Require Parts

- SOC FMC_MCM_1000
- Xilinx JTAG programming cable
- Xilinx iMPact Software Tool (14.7)
- Updated BIT or MCS file provided by System-on-Chip Technologies
- Module to Update

4. Programming

Start with the FMC_MCM_1000 powered off and follow the steps below. HDMI, Network, and USB Uart cables can be connected, as they will not affect reprogramming.

1. Connect a Xilinx JTAG cable to J3, the FPGA JTAG header.
2. Ensure the module is properly connected in its socket
3. For base board FMC_MCM_1000:

If you are programming SOC Module (MCM_xxxx), position the JTAG Selector (S2) towards the module. See Fig 2 A.

If you are programming the base board (FMC_MCM_1000), position the JTAG Selector (S2) away the module (to the LED side).

4. For base board VTR_2000 or VTR_4000, see Fig 2 B.

If you are programming SOC Module (MCM_xxx) on J2, position the JTAG Selector (S2) to “TO CON” and “TO J2”,

If you are programming SOC Module (MCM_xxx) on J11, position the JTAG Selector (S2) to “TO CON” and “TO s2”,

If you are programming board (VTR_2000/4000), position the JTAG Selector (S2) to “TO FPGA”.

Fig. 2 A– JTAG Switch position for Modules on FMC_MCM_1000
5. Power on the board.

6. Open Xilinx’s iM pact Tool

   a. When you see Fig 3.A, “Automatically create and save a project”, click “No”,

   ![Automatically create and save a project](image)

   Fig 3.A iM pact start

   b. When Fig 3.B, “New Impact Project” is shown, click “Cancel”,

   ![New Impact Project](image)
c. Double Click the Boundary Scan Option (Fig 3.C)
d. Next Select File -> Initialize Chain (Ctrl+I) (Fig 4)

![Initialize Chain](image)

**Fig. 4 – Initialize Chain**

e. Click ‘OK’ to any pop-up window

7. Ensure the correct Part was detected.

For SOC MCM_1000 Modules the correct part is the **xc6slx150**.

For SOC FMC_MCM_1000 Modules the correct part is the **xc6slx45**.

For SOC MCM_1000A Modules the correct part is the **xc7a200t**.

If a different part was detected please check the JTAG switch ‘S2’ on the FMC_MCM_1000.

A) Programming a **BIT** file (Fig 5)

a. Double click the Green Xilinx Chip

b. Select the BIT file provided by SOC

c. Select ‘No’ when asked to attach a SPI or BPI PROM
d. You will now see the BIT file name under the Xilinx Chip

e. Right Click on the Chip and Select **Program**

f. Programming will complete in a few seconds

g. *Please ignore any CRC warnings*

B) Programming a MCS file (Fig 5)

a. Double click in the Dashed Blue Box (SPI/BPI) above the Xilinx Chip

![Dashed Blue Box Diagram]

For MSC Files

For BIT Files

b. Select the MCS file provided by SOC

c. Ensure the Correct Flash part is selected as indicated in Fig 6 or Fig 7, then Click OK

d. The Dashed Blue box should now say ‘FLASH’

e. Right Click ‘Flash’ and Select Program

f. Select ‘OK’ for the next dialog box

g. Programming can take up to 30 minutes

h. Once complete Power-cycle the board
5. Troubleshooting

5.1 EEPROM ID Check Failure

If you receive an ID Code failure when attempting to program the flash, an environment variable must be set in Windows.
Please follow your operating systems method for setting environment variables and set the following environment variable. Once complete restart iMpact and proceed with programming.

    XIL_IMPACT_SKIPIDCODECHECK=1

If you still receive same error, try to restart your computer or re-login into your OS account.

5.2 Other error detected

If any other error detected:

1. Check if you used correct JTAG position, refer to 4.3 or 4.4.
2. Check if you indicated correct part of FLASH, refer to Fig 6 or Fig 7.

If you confirmed the above two points and an error is still shown, restart your computer to try again.

6. Ordering Information

Fig. 7 shows the product code naming convention for the SOC MPEG codec modules and IP cores. Users can order the standard configurations listed in Tables 1-12 in Section 2. Non-standard codec modules can be ordered following the same naming format (minimum order quantity is required for non-standard modules).
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<thead>
<tr>
<th>EC</th>
<th>DC</th>
<th>TC</th>
<th>V</th>
<th>A</th>
<th>VA</th>
<th>H264</th>
<th>MPEG2</th>
<th>10b</th>
<th>8b</th>
<th>M</th>
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<td>Encoder</td>
<td>Decoder</td>
<td>Transcoder</td>
<td>Video only</td>
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<td>H.264/AVC</td>
<td>MPEG2</td>
<td>10bit Precession</td>
<td>8bit Precession</td>
<td>Module</td>
<td>IP Core</td>
</tr>
</tbody>
</table>

- EC-V-H264-10b-60-1080-M
- M=Module
- C=IP Core

1080 = up to 1080
(1080X1920, Interlaced or progressive)

720 = up to 720
(720X1280, Interlaced or progressive)

480 = up to 480
(480X640, Interlaced or progressive)

1080 = up to 1080
(1080X1920, Interlaced or progressive)

720 = up to 720
(720X1280, Interlaced or progressive)

480 = up to 480
(480X640, Interlaced or progressive)

30 = 30 Frame/Sec.

60 = 60 Frame/Sec.

**Fig. 7** SOC MPEG codec (IP cores and modules) product code naming convention

Contact Information

Please Contact SOC head office or distributor for product details or place orders.

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