



# AC701 Si570 Programming

April 2015

XTP230

# Revision History

Date	Version	Description
04/30/14	11.0	Recompiled for 2015.1.
11/24/14	10.0	Recompiled for 2014.4.
10/08/14	9.0	Recompiled for 2014.3.
06/09/14	8.0	Recompiled for 2014.2.
04/16/14	6.0	Recompiled for 2014.1.
12/18/13	5.0	Recompiled for 2013.4.
10/23/13	4.0	Recompiled for 2013.3.
06/19/13	3.0	Recompiled for 2013.2.
04/03/13	2.0	Recompiled for 2013.1.
02/04/13	1.0	Initial version. As per AR54044, added 2012.4 device pack.

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# AC701 Si570 Programming Overview

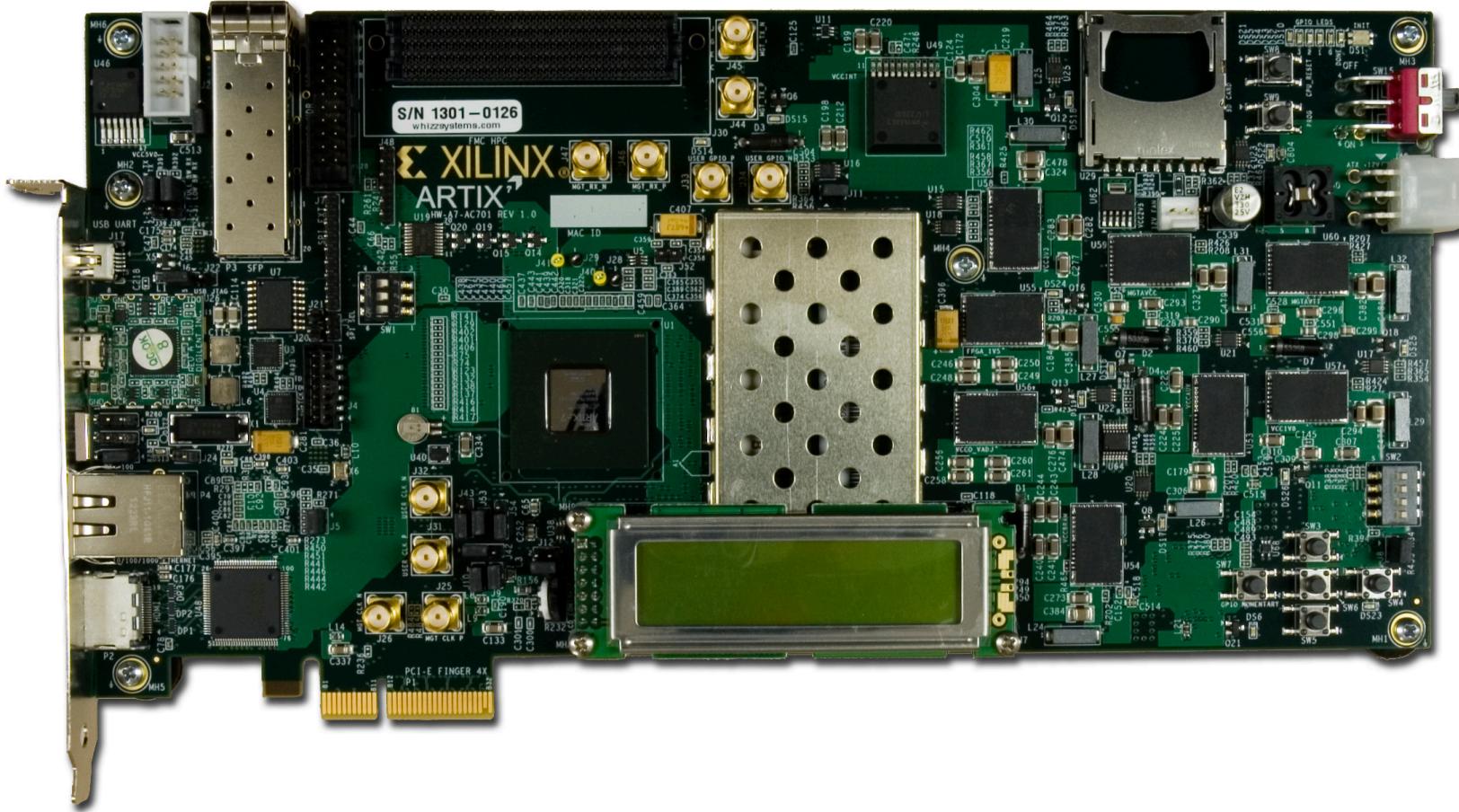
- Xilinx AC701 Board
- Software Requirements
- Setup for the AC701 Si570 Programming
- Programming the Si570
- Correcting the Frequency
- Programming the FMC Si570
- References

# AC701 Si570 Programming Overview

## ► Description

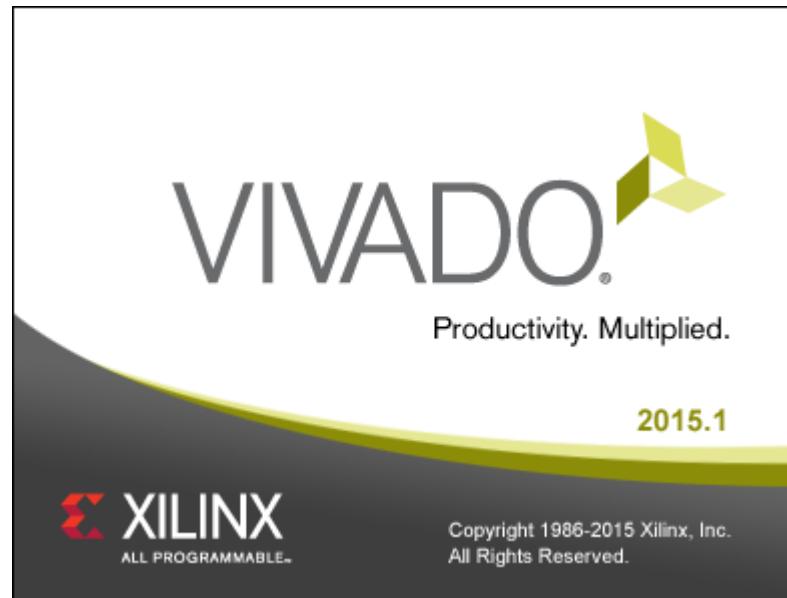
- The AC701 board has a Silicon Labs Si570 Programmable Oscillator that defaults to 156.25 MHz. Via the IIC bus, the frequency of this device can be changed. This tutorial shows how to change the output frequency of this device.

# Xilinx AC701 Board



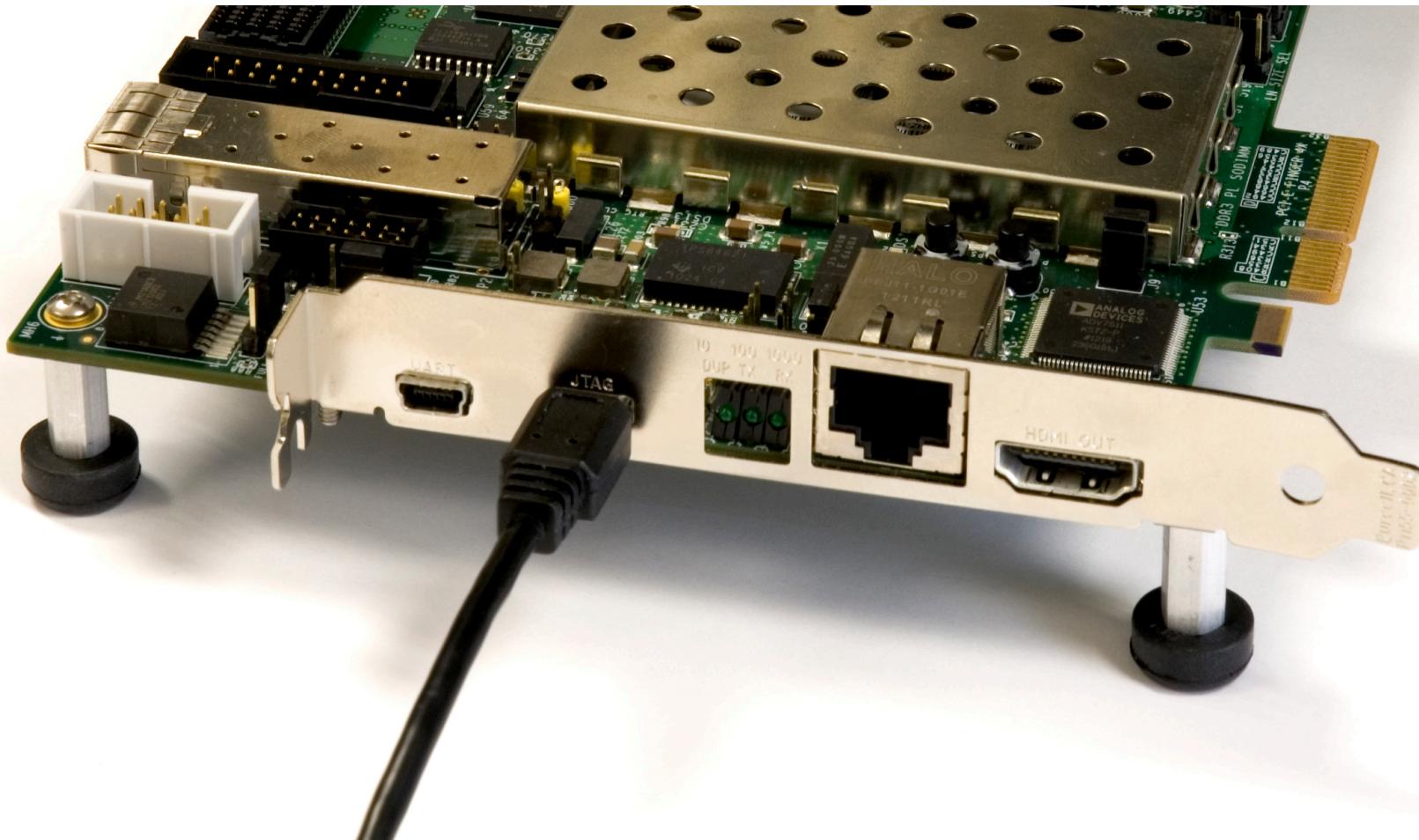
# Vivado Software Requirements

- Xilinx Vivado Design Suite 2015.1, Design Edition + SDK
  - Combined installer



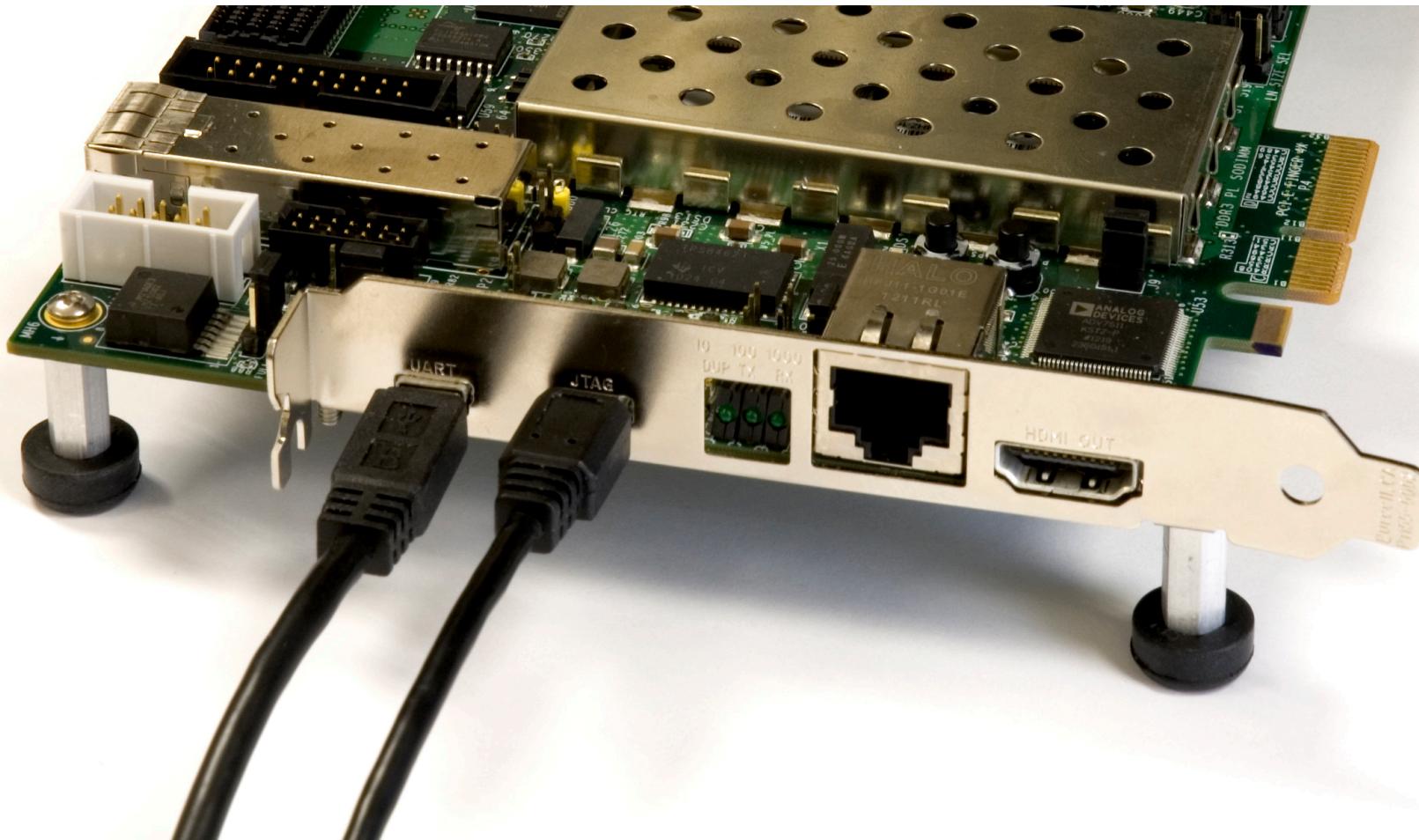
# AC701 Setup

- ▶ Connect a USB Type-A to Micro-B cable to the USB JTAG (Digilent) connector on the AC701 board
  - Connect this cable to your PC



# AC701 Setup

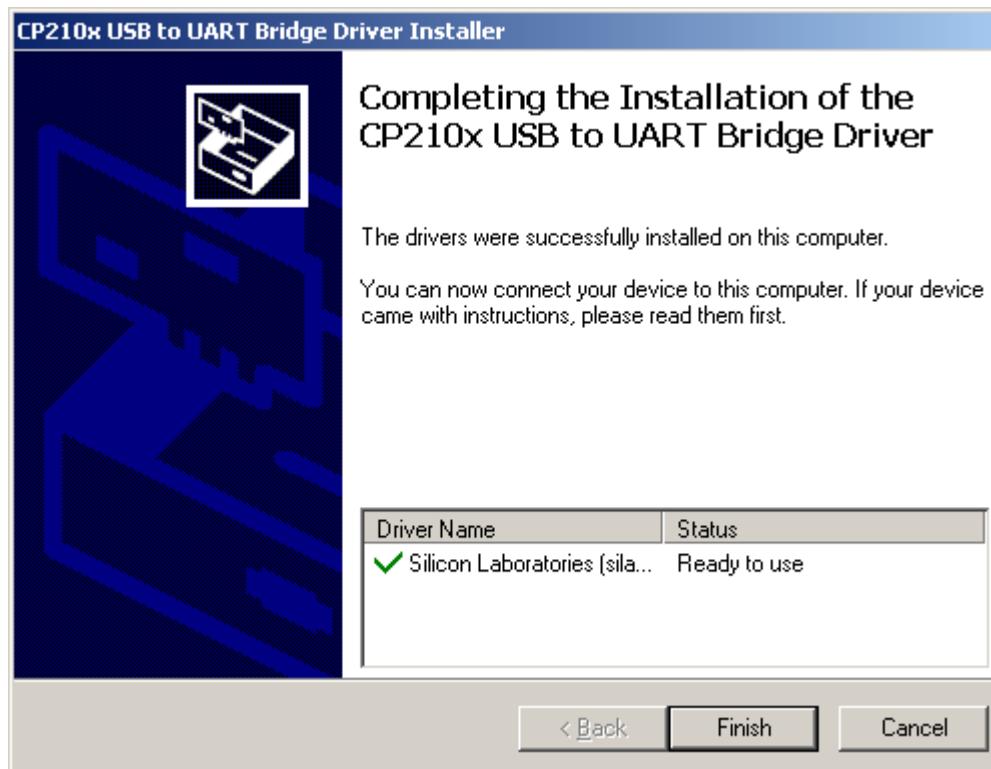
- ▶ Connect a USB Type-A to Mini-B cable to the USB UART connector on the AC701 board
  - Connect this cable to your PC
  - Power on the AC701 board for UART Drivers Installation



# AC701 Setup

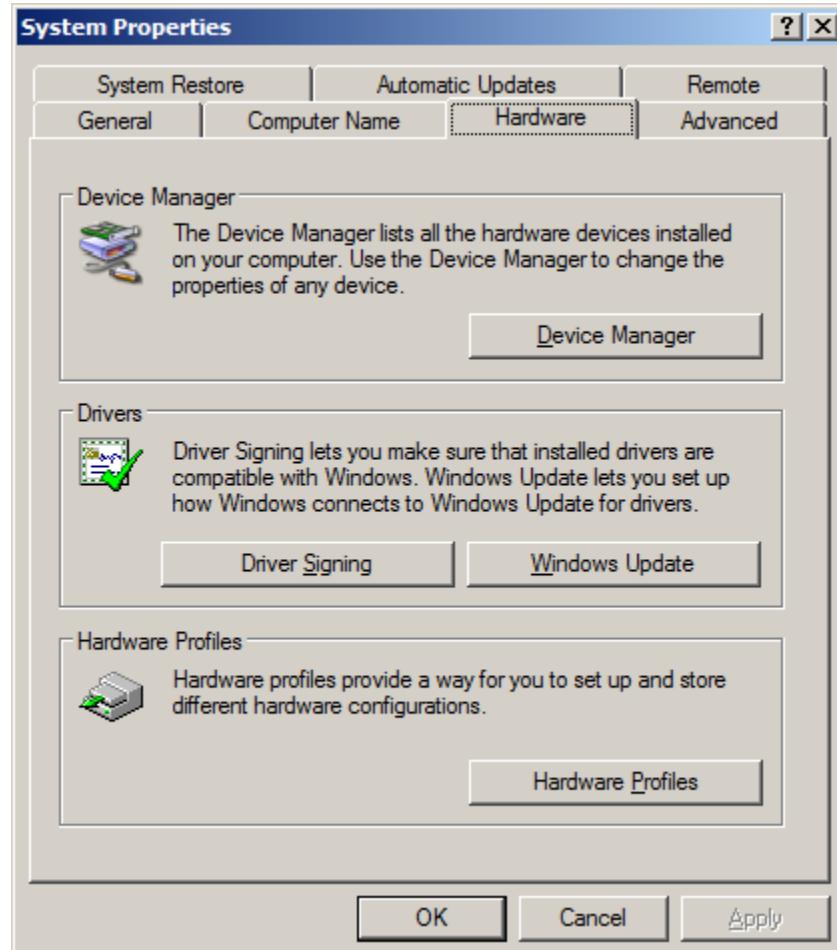
## ➤ Install USB UART Drivers

- Refer to [UG1033](#) for Installation details



# AC701 Setup

- Reboot your PC if necessary
- Right-click on My Computer and select Properties
  - Select the Hardware tab
  - Click on Device Manager

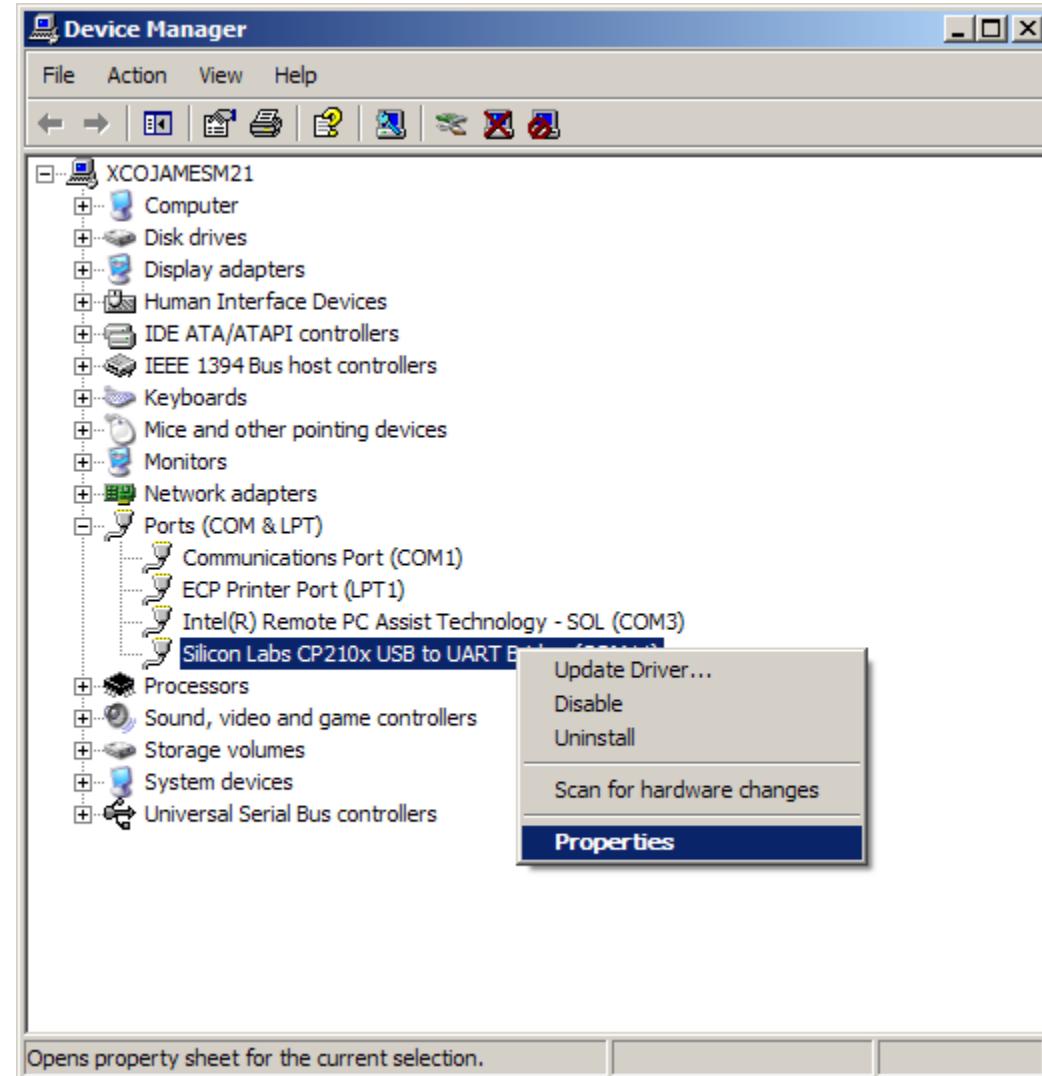


# AC701 Setup

## ► Expand the Ports

### Hardware

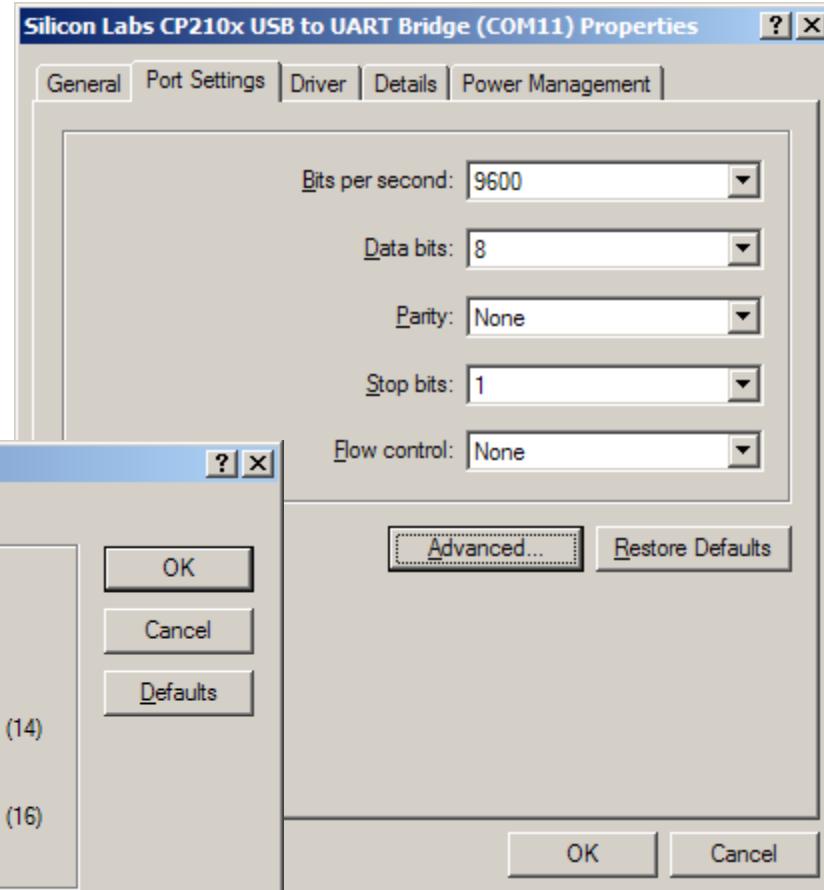
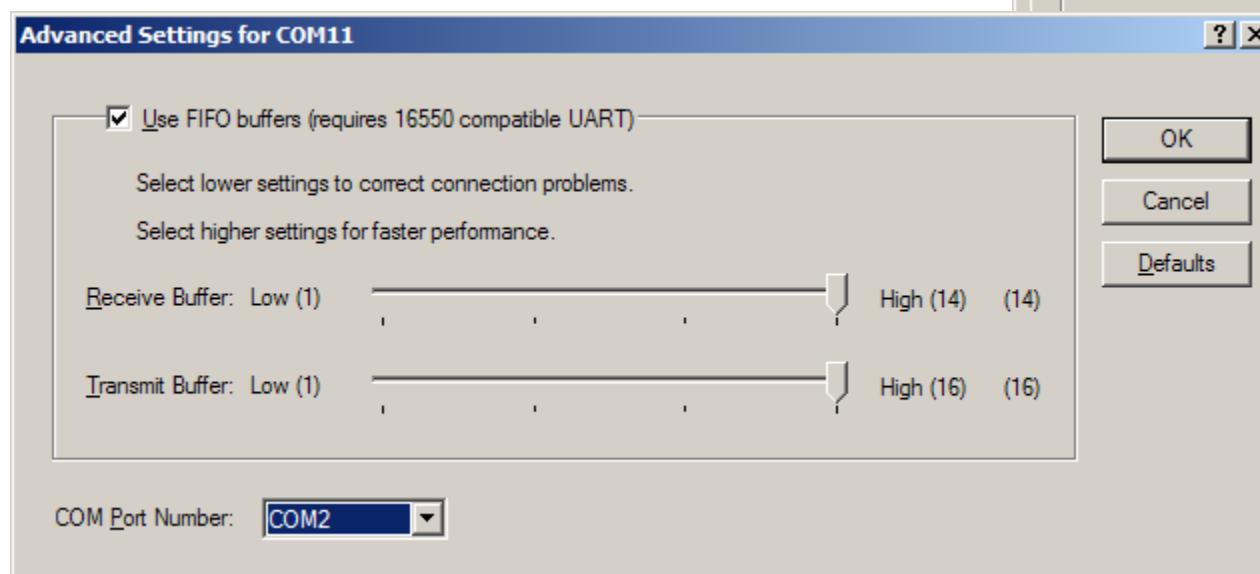
- Right-click on Silicon Labs CP210x USB to UART Bridge and select Properties



# AC701 Setup

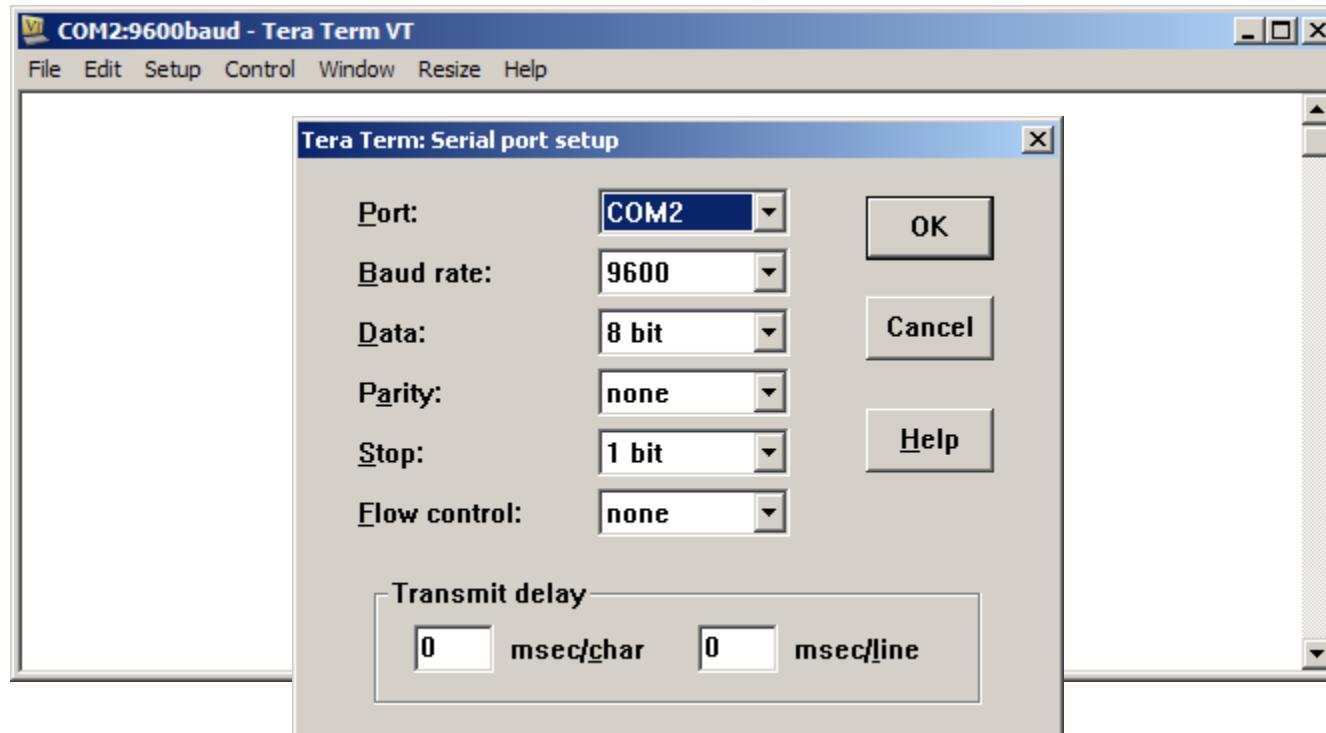
## ► Under Port Settings tab

- Click Advanced
- Set the COM Port to an open Com Port setting from COM1 to COM4



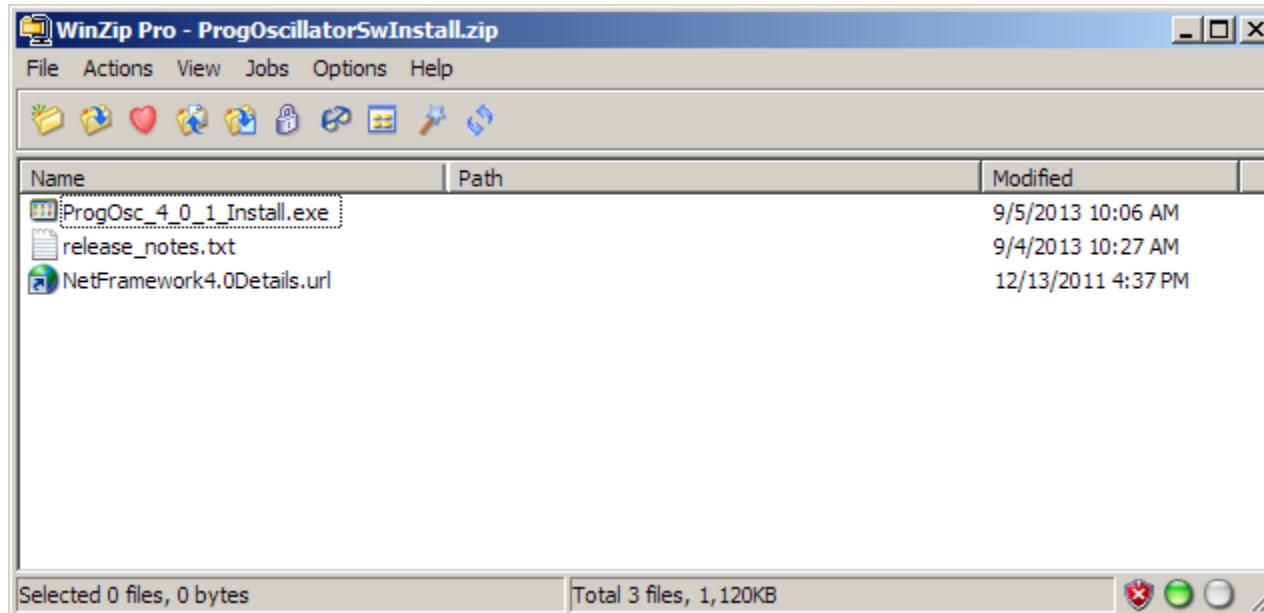
# AC701 Setup

- Refer to [UG1036](#) for Tera Term installation
- Board Power must be on before starting Tera Term
- Start the Terminal Program
  - Select your USB Com Port
  - Set the baud to 9600



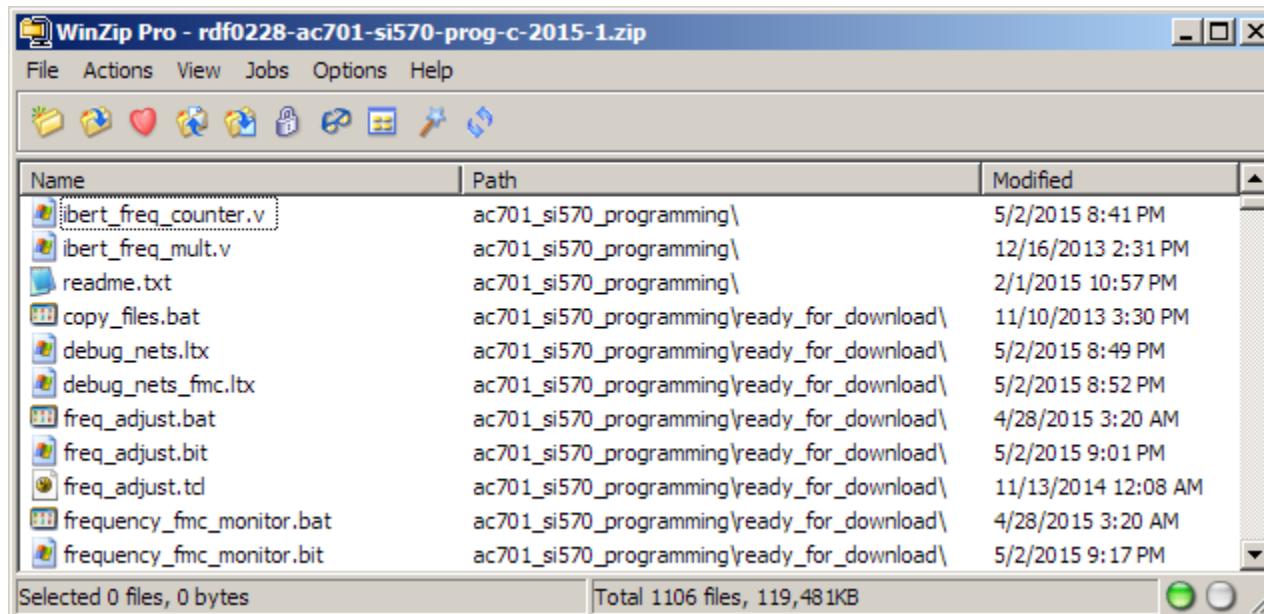
# Si Labs Programmable Oscillator Calculator

► Download [ProgOscillatorSwInstall.zip](#)



# Setup for AC701 Si570 Programming

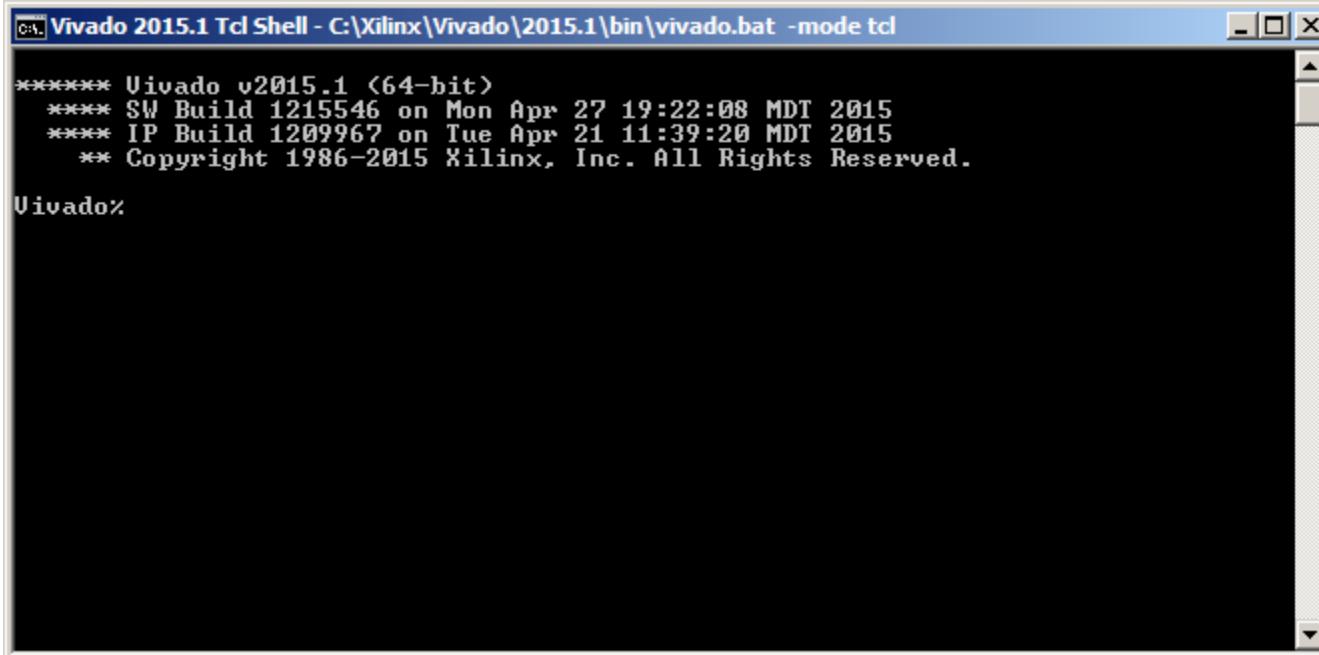
- Unzip the AC701 Si570 Programming Design Files (2015.1 C) ZIP file to your C:\ drive
  - Available through <http://www.xilinx.com/ac701>



# AC701 Si570 Programming

## ► Open a Vivado Tcl Shell:

**Start → All Programs → Xilinx Design Tools → Vivado 2015.1 →  
Vivado 2015.1 Tcl Shell**

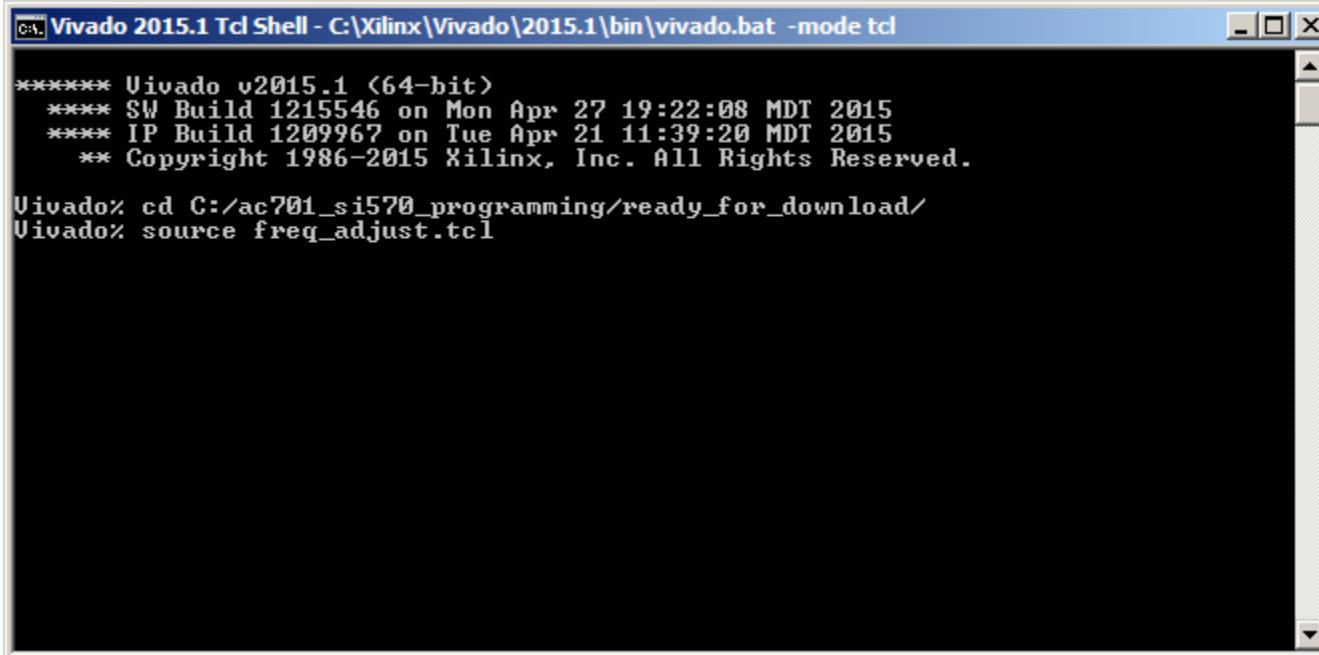


The screenshot shows a terminal window titled "Vivado 2015.1 Tcl Shell - C:\Xilinx\Vivado\2015.1\bin\vivado.bat -mode tcl". The window displays the following text:  
\*\*\*\*\* Vivado v2015.1 (64-bit)  
\*\*\*\* SW Build 1215546 on Mon Apr 27 19:22:08 MDT 2015  
\*\*\*\* IP Build 1209967 on Tue Apr 21 11:39:20 MDT 2015  
\*\* Copyright 1986-2015 Xilinx, Inc. All Rights Reserved.  
Vivado%

# AC701 Si570 Programming

- Download the Frequency Adjust bitstream with Vivado
- In the Vivado Tcl Shell type:

```
cd C:/ac701_si570_programming/ready_for_download/  
source freq_adjust.tcl
```



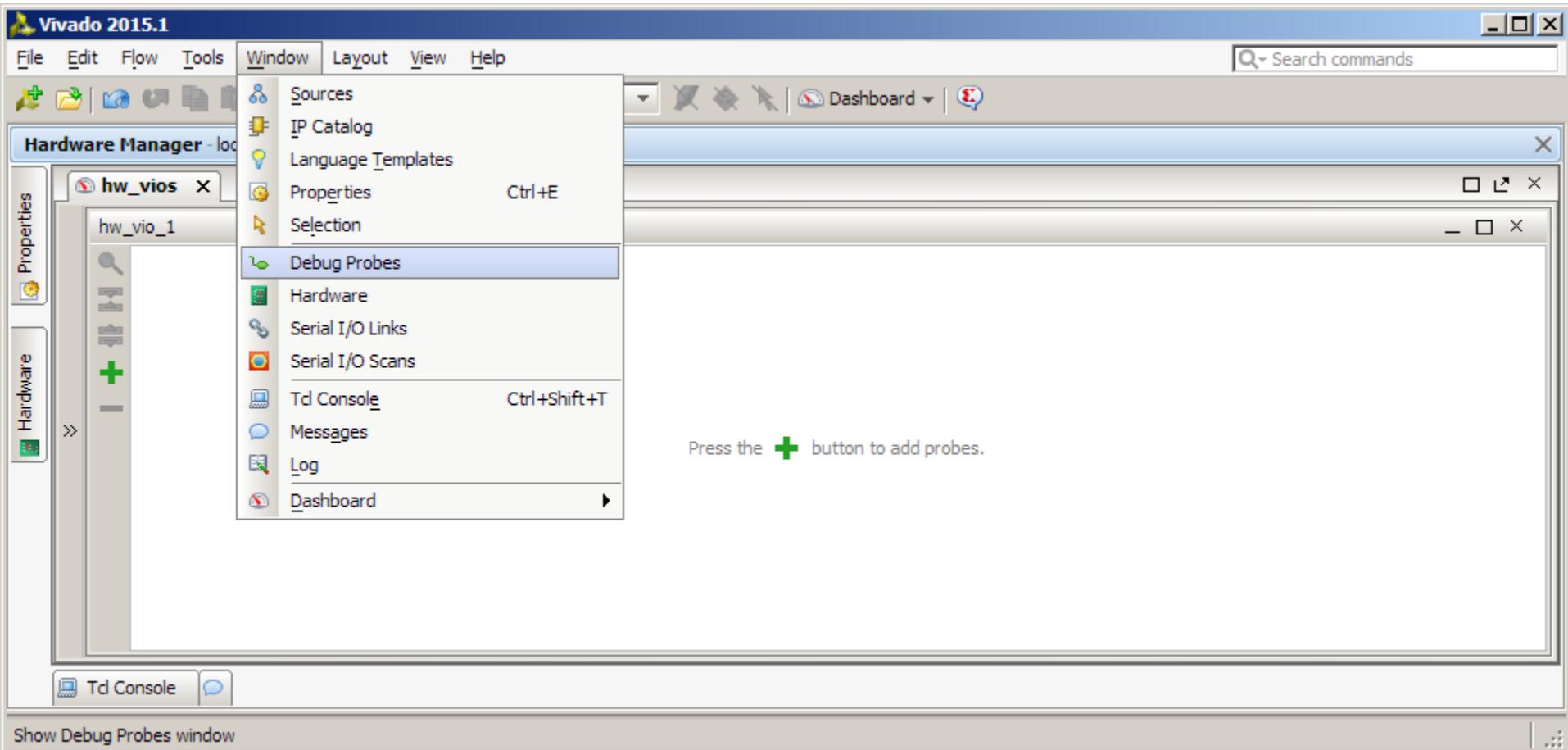
The screenshot shows a Windows command-line interface window titled "Vivado 2015.1 Tcl Shell - C:\Xilinx\Vivado\2015.1\bin\vivado.bat -mode tcl". The window displays the following text:

```
***** Vivado v2015.1 (64-bit)
***** SW Build 1215546 on Mon Apr 27 19:22:08 MDT 2015
***** IP Build 1209967 on Tue Apr 21 11:39:20 MDT 2015
** Copyright 1986-2015 Xilinx, Inc. All Rights Reserved.

Vivado> cd C:/ac701_si570_programming/ready_for_download/
Vivado> source freq_adjust.tcl
```

# AC701 Si570 Programming

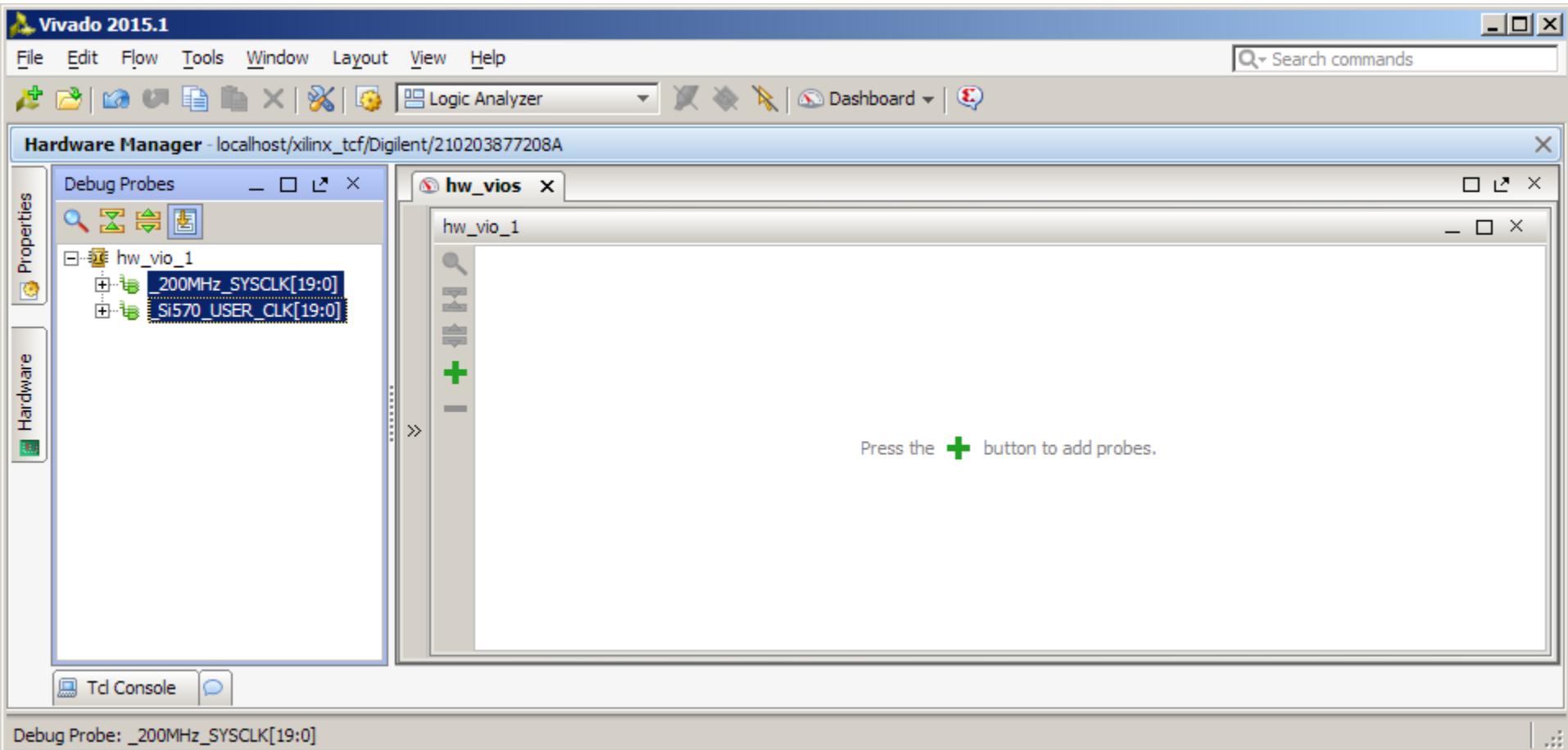
## ► Open the Debug Probes



# AC701 Si570 Programming

## ► View the Debug Probes tab

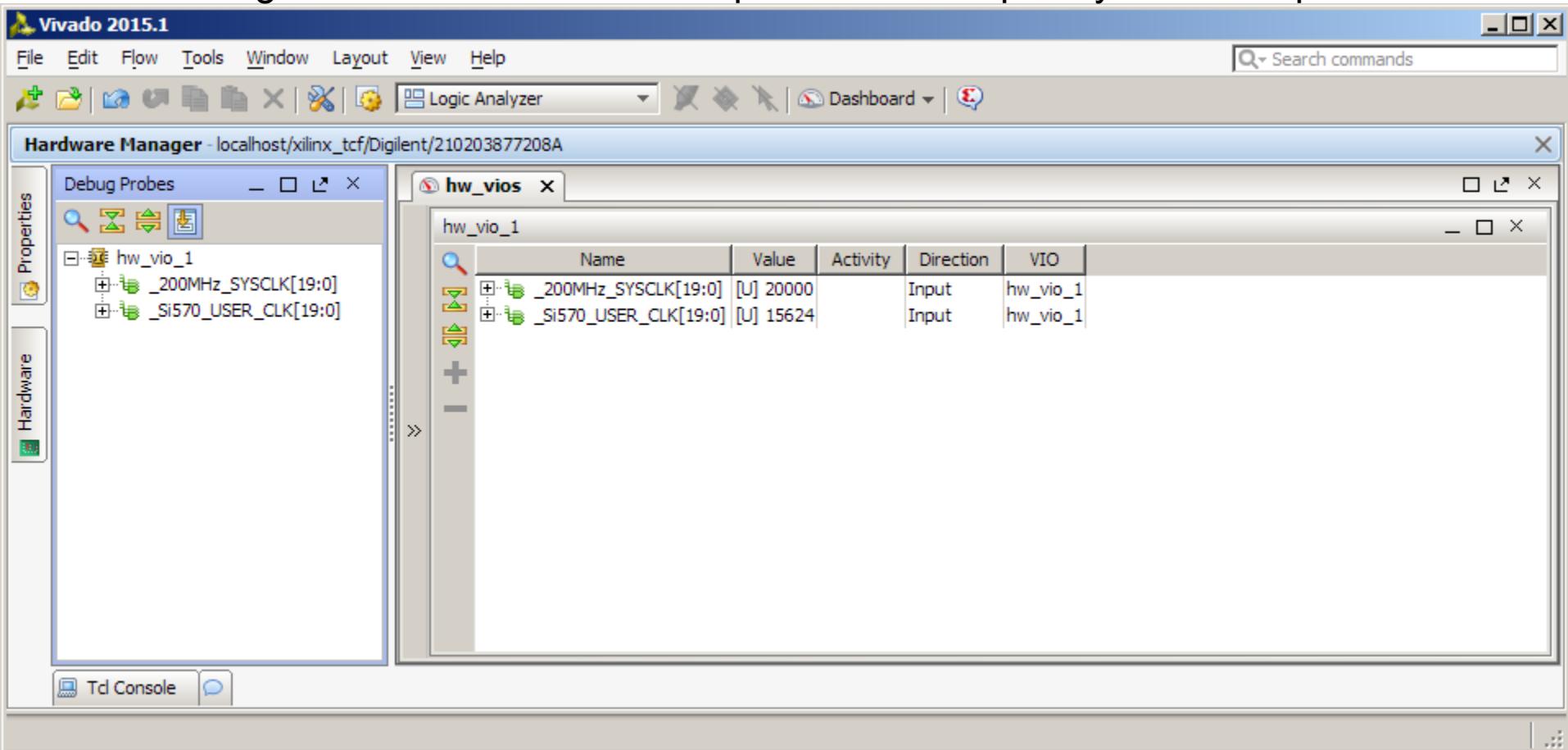
- Select the probes and drag to the **hw\_vios** tab



# AC701 Si570 Programming

## ► View the VIO Cores under the Debug Probes tab

- The VIO Probes show 200 MHz for the System Clock, and 156.25 MHz for the Si570 User Clock
- Unsigned decimal values correspond to the frequency of each input



# AC701 Si570 Programming

- For this example, Si570\_0 will be reprogrammed from 156.25 to 200 MHz
  - This requires use of the SiLabs Programmable Oscillator Calculator
- To use the SiLabs calculator, the correct fXTAL value for each Si570 must be determined, using this equation:

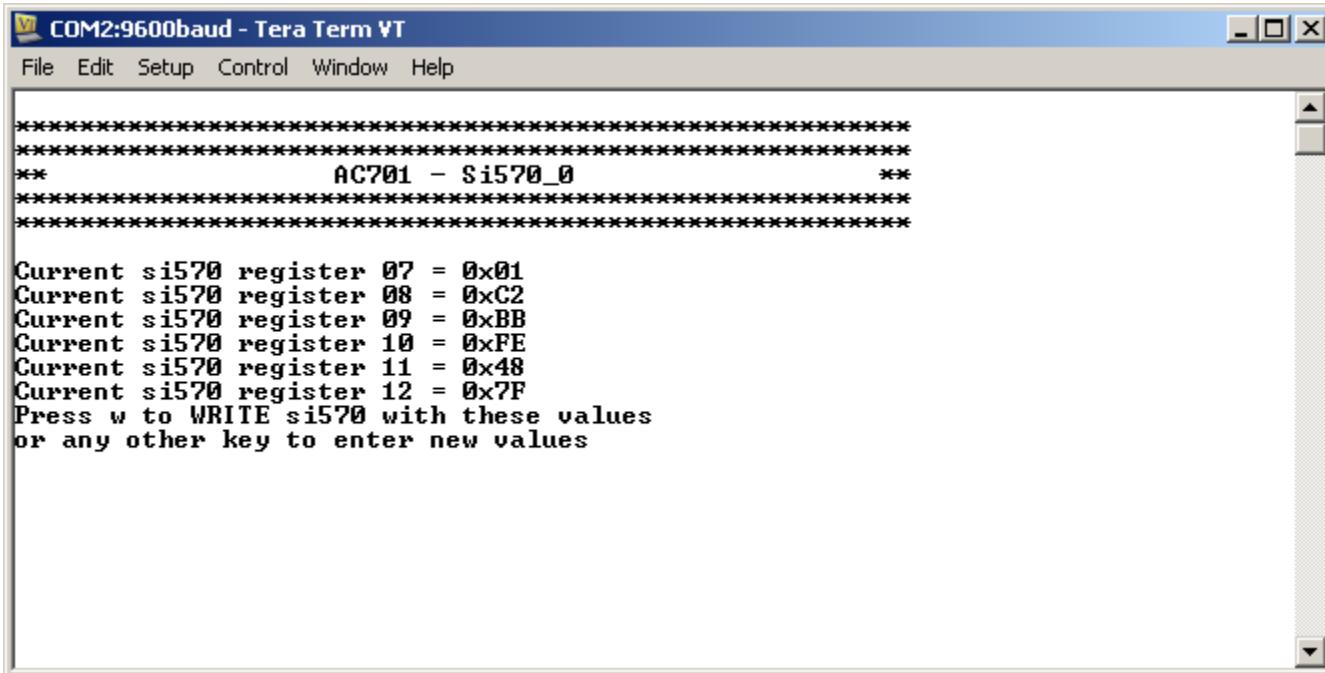
$$f_{XTAL} = \frac{F_{out} \times HSDIV \times N1}{RFREQ}$$

- For this equation,
  - Fout = 156.25, the preprogrammed frequency of the Si570s on the AC701
- We need to determine:
  - RFREQ
  - HSDIV
  - N1
- These can be found by reading back the registers on the Si570

# AC701 Si570 Programming

## ► The terminal window shows the current register settings for the Si570

- The power-on values will appear in the terminal window
- Note the value of 0x01C2BBFE487F



The screenshot shows a terminal window titled "COM2:9600baud - Tera Term VT". The window displays the following text:

```
*****
**          AC701 - Si570_0          **
*****
Current si570 register 07 = 0x01
Current si570 register 08 = 0xC2
Current si570 register 09 = 0xBB
Current si570 register 10 = 0xFE
Current si570 register 11 = 0x48
Current si570 register 12 = 0x7F
Press w to WRITE si570 with these values
or any other key to enter new values
```

**Note:** The values reported by your Si570 may differ from those shown

# AC701 Si570 Programming

- The value, 0x01C2BBFE487F, corresponds to the contents of the Si570's registers, 7 to 12:

Register	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
7	High Speed/ N1 Dividers	HS_DIV[2:0]			N1[6:2]				
8	Reference Frequency	N1[1:0]		RFREQ[37:32]					
9	Reference Frequency	RFREQ[31:24]							
10	Reference Frequency	RFREQ[23:16]							
11	Reference Frequency	RFREQ[15:8]							
12	Reference Frequency	RFREQ[7:0]							

# AC701 Si570 Programming

- Extract the HS\_DIV and N1 values from 0x01C2BBFE487F:
- HS\_DIV = 0b000 which corresponds to “4”
- N1 = 0b0000111 which corresponds to “8”

Bit	D7	D6	D5	D4	D3	D2	D1	D0	
Name	HS_DIV[2:0]			N1[6:2]					
Type	R/W						R/W		

Bit	Name	Function
7:5	HS_DIV[2:0]	<b>DCO High Speed Divider.</b> Sets value for high speed divider that takes the DCO output $f_{OSC}$ as its clock input. 000 = 4 001 = 5 010 = 6 011 = 7 100 = Not used. 101 = 9 110 = Not used. 111 = 11
4:0	N1[6:2]	<b>CLKOUT Output Divider.</b> Sets value for CLKOUT output divider. Allowed values are [1] and [2, 4, 6, ..., $2^7$ ]. Illegal odd divider values will be rounded up to the nearest even value. The value for the N1 register can be calculated by taking the divider ratio minus one. For example, to divide by 10, write 0001001 (9 decimal) to the N1 registers. 0000000 = 1 1111111 = $2^7$

# AC701 Si570 Programming

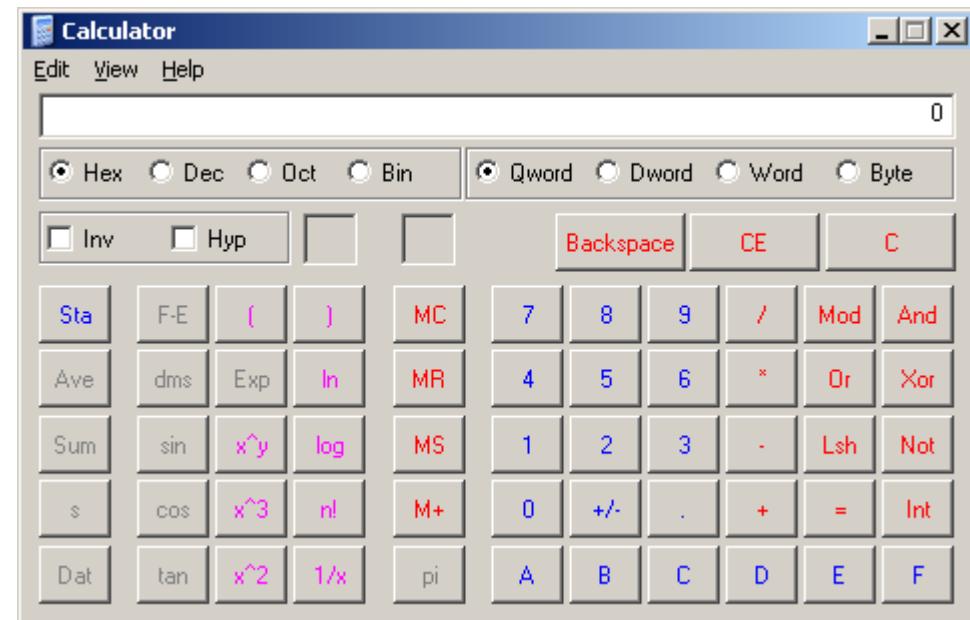
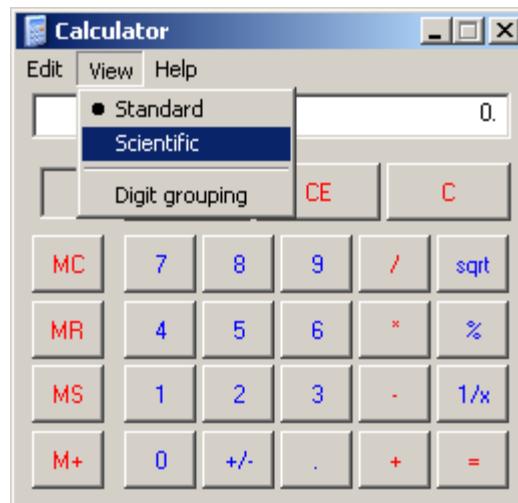
► Extract the RFREQ value from 0x01C2BBFE487F :

– 02BBFE487F

Register	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
7	High Speed/ N1 Dividers	HS_DIV[2:0]			N1[6:2]				
8	Reference Frequency	N1[1:0]		RFREQ[37:32]					
9	Reference Frequency	RFREQ[31:24]							
10	Reference Frequency	RFREQ[23:16]							
11	Reference Frequency	RFREQ[15:8]							
12	Reference Frequency	RFREQ[7:0]							

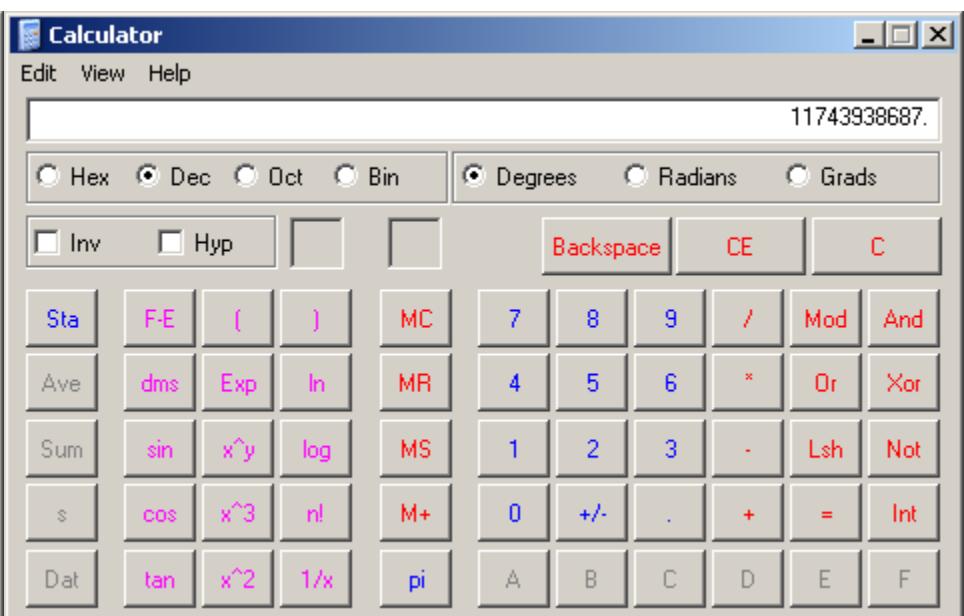
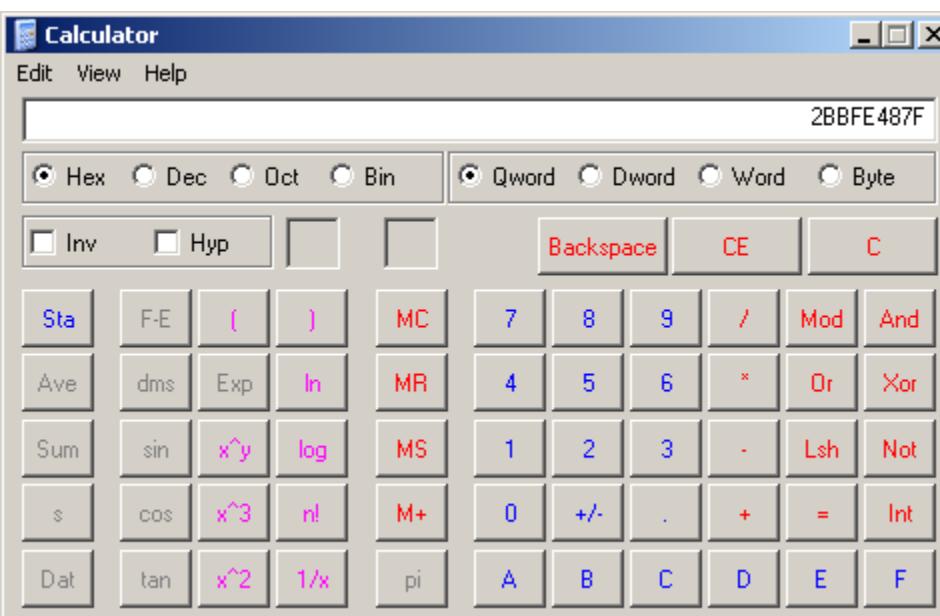
# AC701 Si570 Programming

- Open the Window Calculator
- Set to Scientific and Hex mode:



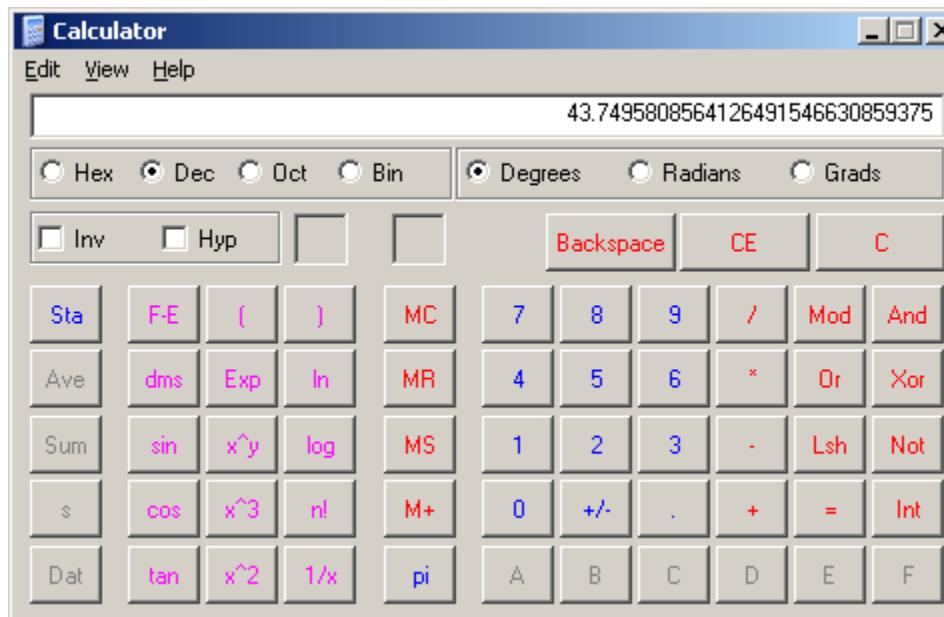
# AC701 Si570 Programming

- Enter or paste the RFREQ value, 02BBFE487F:
- Convert it to Decimal



# AC701 Si570 Programming

- Divide by  $2^{28}$
- This is the value for RFREQ:



# AC701 Si570 Programming

► For this equation,

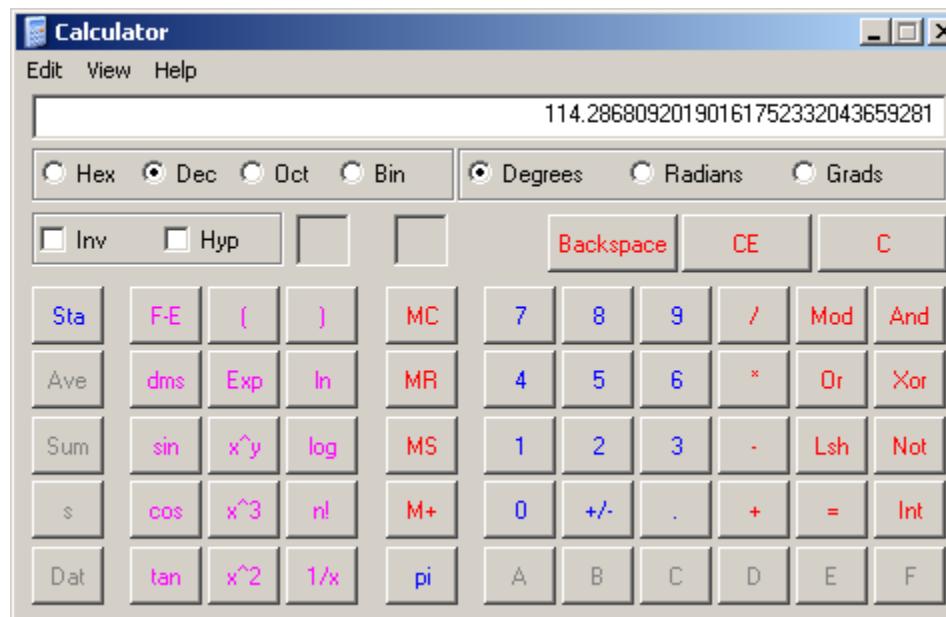
- $F_{out} = 156.25$
- $RFREQ = 43.7495808564126491546630859375$
- $HSDIV = 4$
- $N1 = 8$
- $F_{out} \times HSDIV \times N1 = 5000$
- $f_{XTAL} = 5000 / RFREQ$

$$f_{XTAL} = \frac{F_{out} \times HSDIV \times N1}{RFREQ}$$

# AC701 Si570 Programming

► For this equation,

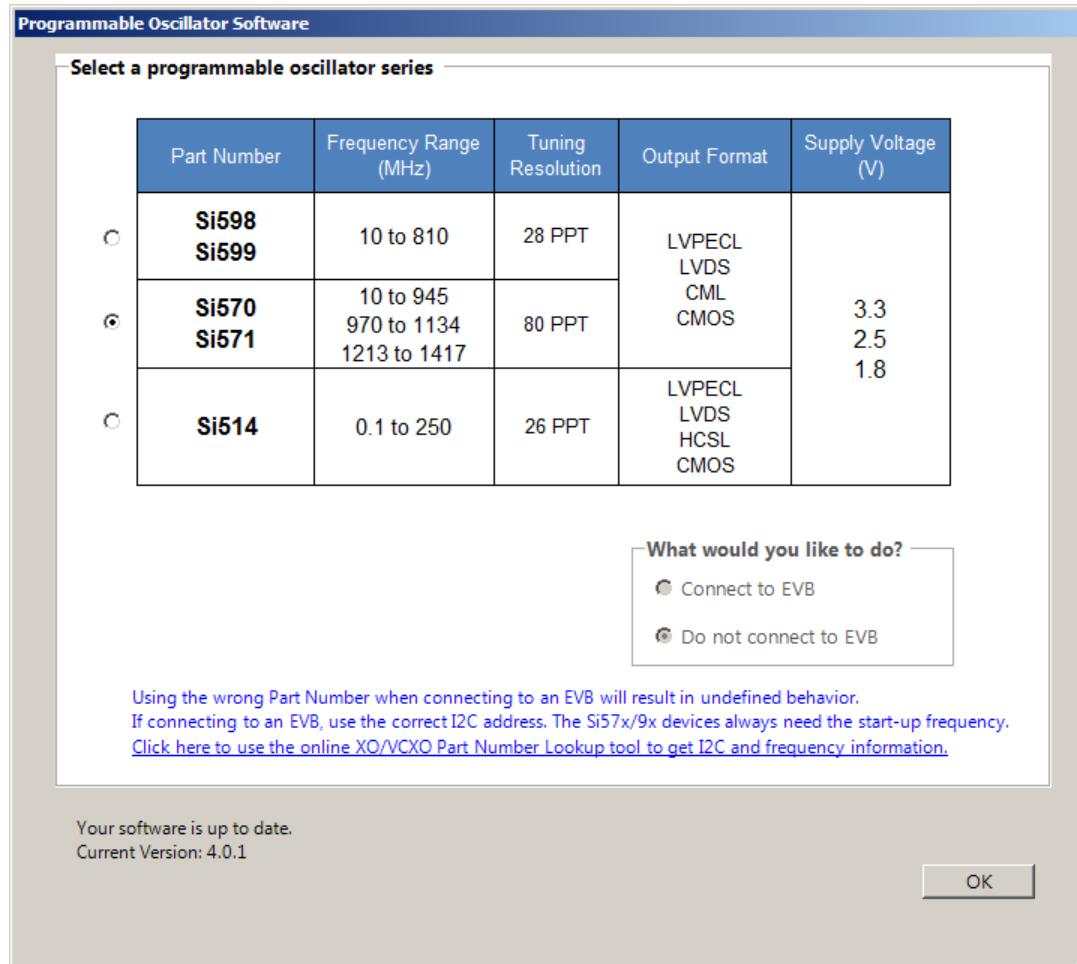
- Divide **43.7495808564126491546630859375** by **5000**
- Take the reciprocal
- fXTAL = **114.28680920190161752332043659281**
- Ctrl-C to copy this value



# AC701 Si570 Programming

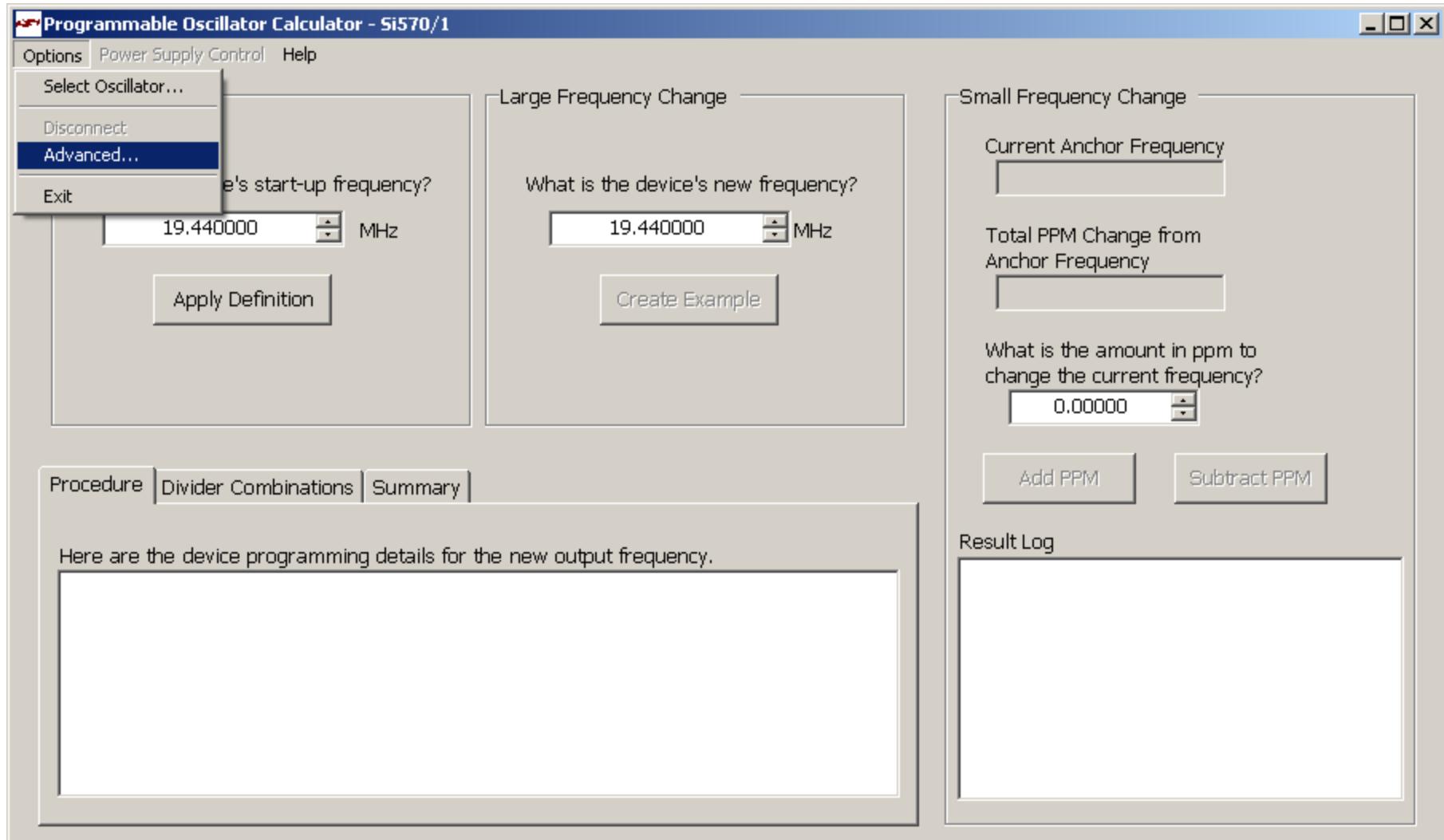
## ► Open the SiLabs Programmable Oscillator Calculator

- Select the Si570 and click OK



# AC701 Si570 Programming

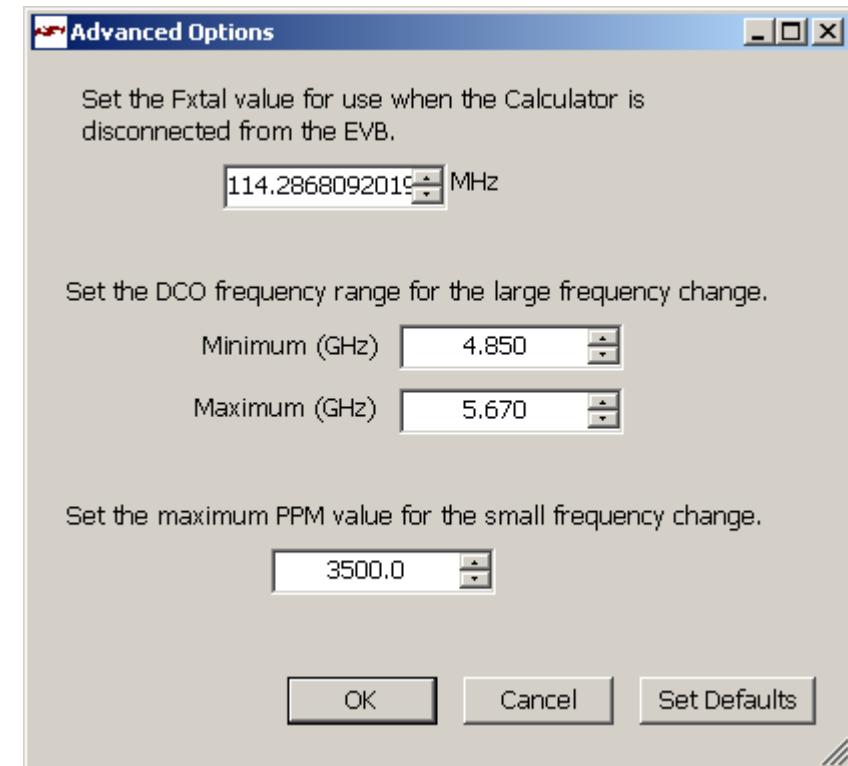
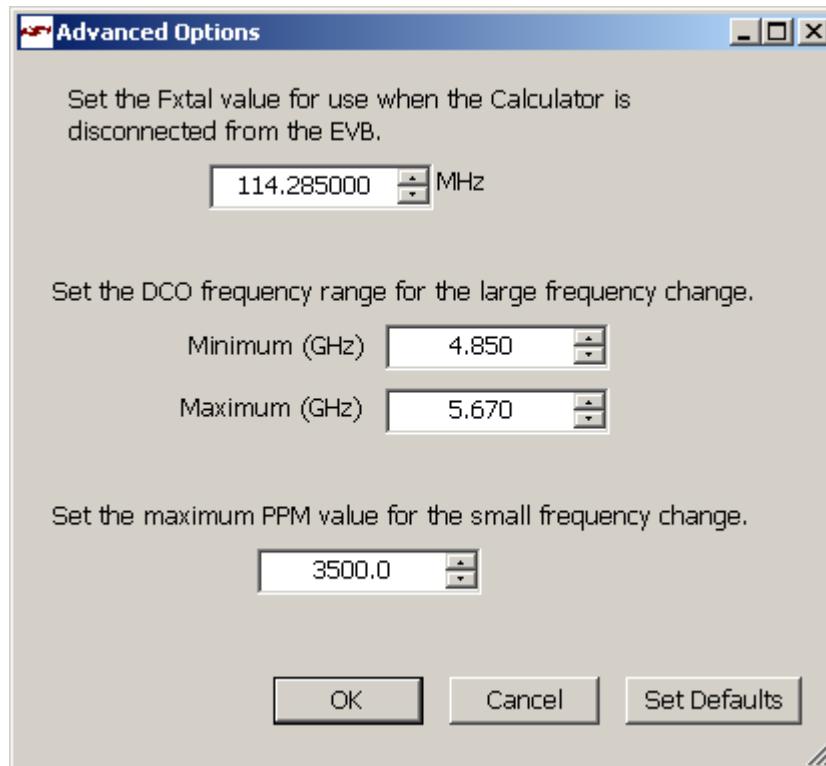
► Select Options → Advanced...



# AC701 Si570 Programming

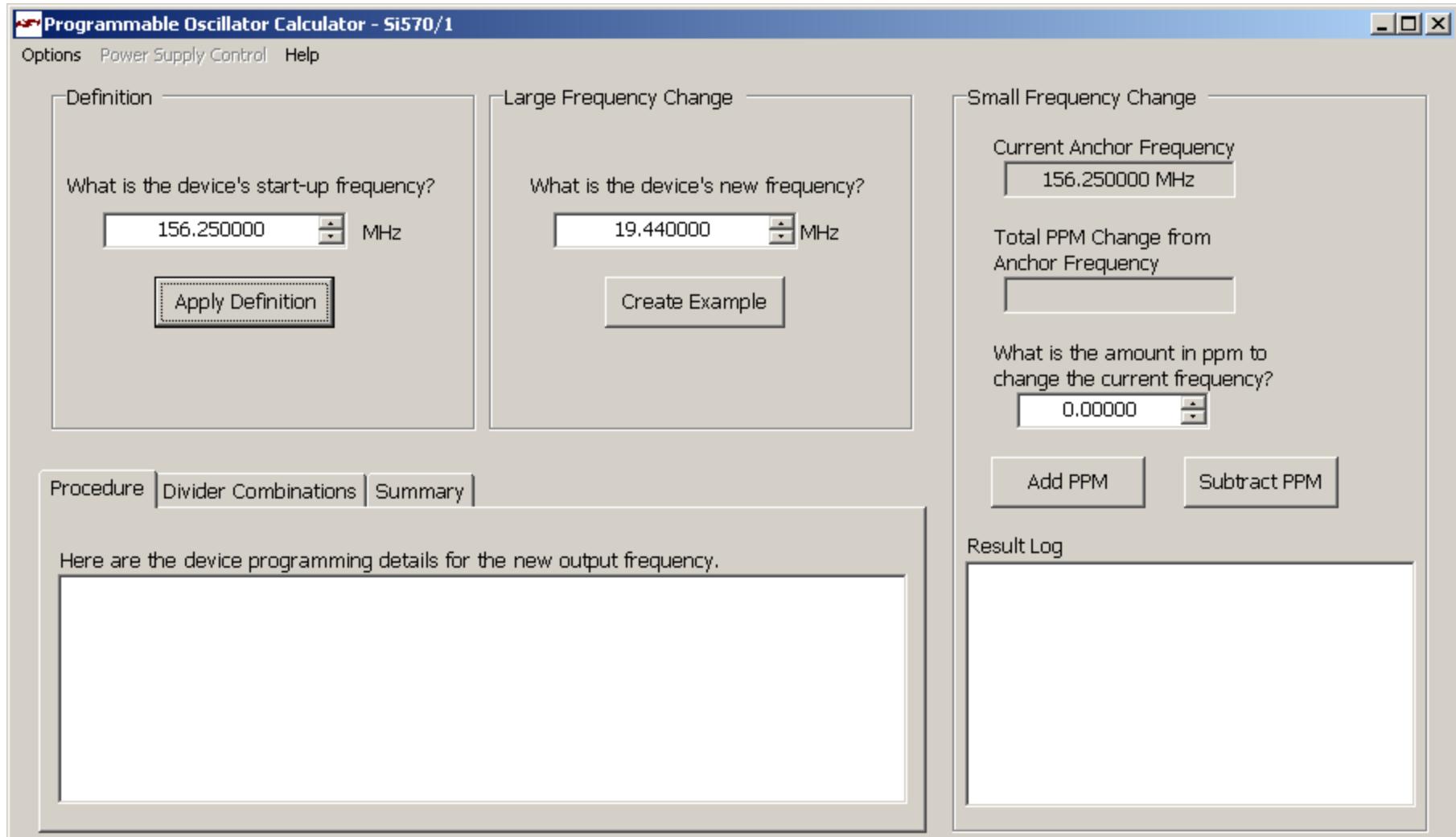
## ► Paste in the value of fXTAL

- The calculator will round the number appropriately
- Click OK



# AC701 Si570 Programming

► Enter 156.25 and click the Apply Definition button



# AC701 Si570 Programming

► Set the new frequency to 200 MHz and click the Create Example button

**Programmable Oscillator Calculator - Si570/1**

Options Power Supply Control Help

Definition

What is the device's start-up frequency?

156.250000 MHz

Apply Definition

Large Frequency Change

What is the device's new frequency?

200.000000 MHz

Create Example

Small Frequency Change

Current Anchor Frequency  
200.000000 MHz

Total PPM Change from Anchor Frequency

What is the amount in ppm to change the current frequency?  
0.00000

Add PPM Subtract PPM

Procedure | Divider Combinations | Summary

Here are the device programming details for the new output frequency.

1) Read start-up frequency configuration (RFREQ, HS\_DIV, and N1) from the device after power-up or register reset

Registers for the Current Configuration

Register	Data
7	0x01
8	0xC2
9	0xBB
10	0xFE

Result Log

disconnected from EVB 12:10 PM -- Program complete!

# AC701 Si570 Programming

- Under the summary tab, the new register configurations are shown
- The startup register configurations will vary slightly from the actual device power-on programming

Procedure   Divider Combinations   Summary

Here is the summary of the programming procedure.

```
= 114.286809 MHz
```

New Configuration

```
Output Frequency = 200.000000 MHz
```

```
HS_DIV = 0x3 = 7
N1      = 0x3 = 4
```

```
fdco = f1 x HS_DIV x N1
      = 200.000000 MHz x 7 x 4
      = 5.600000 GHz
```

```
RFREQ = fdco / fxtal
      = 5.600000 GHz / 114.286809 MHz
      = 48.99953065 = 0x30FFE13D8
```

Start-up Register Configuration

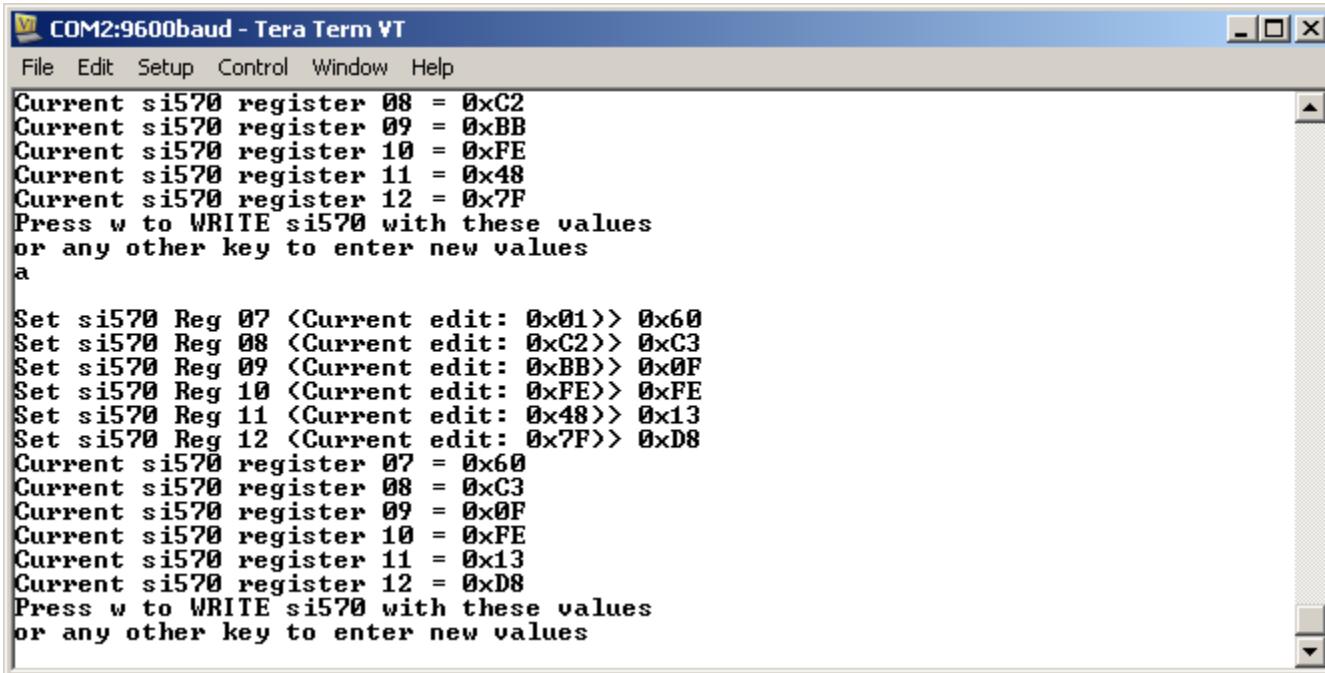
```
Register 7 = 0x01
Register 8 = 0xC2
Register 9 = 0xBB
Register 10 = 0xFE
Register 11 = 0x48
Register 12 = 0x93
```

New Register Configuration

```
Register 7 = 0x60
Register 8 = 0xC3
Register 9 = 0x0F
Register 10 = 0xFE
Register 11 = 0x13
Register 12 = 0xD8
```

# AC701 Si570 Programming

- Press a key to begin entering the newly calculated values
- When done, press “w”



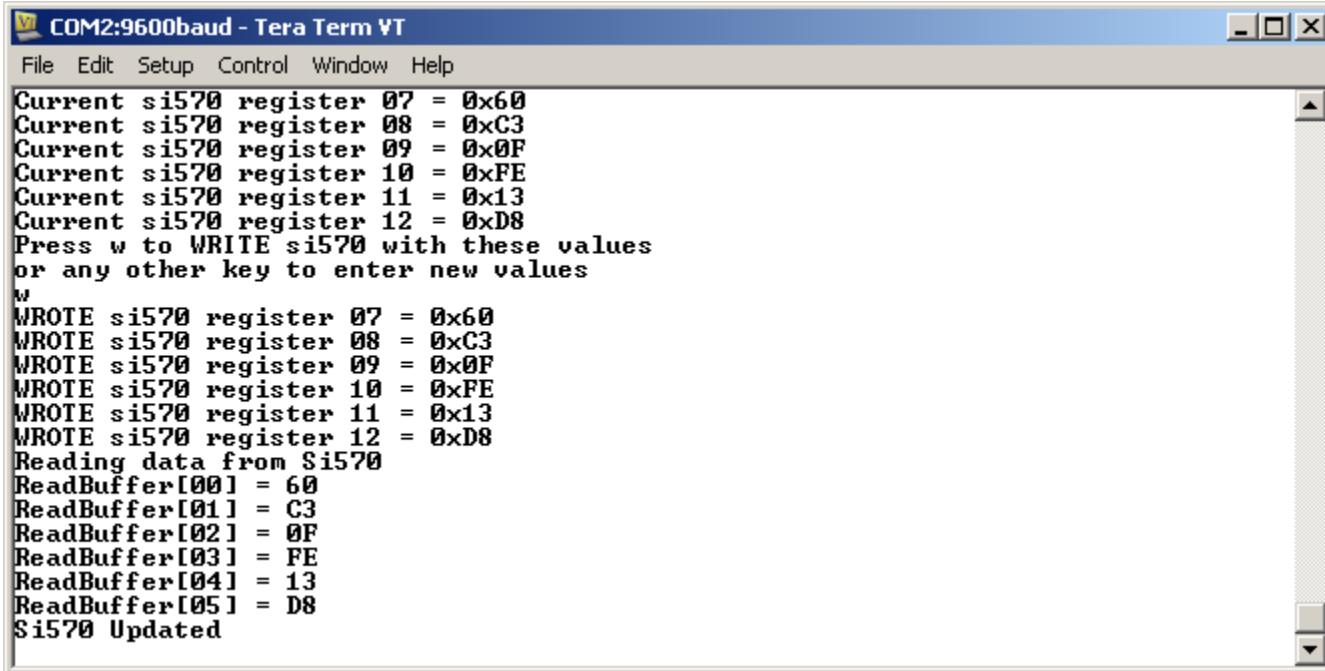
The screenshot shows a terminal window titled "COM2:9600baud - Tera Term VT". The window contains the following text:

```
Current si570 register 08 = 0xC2
Current si570 register 09 = 0xBB
Current si570 register 10 = 0xFE
Current si570 register 11 = 0x48
Current si570 register 12 = 0x7F
Press w to WRITE si570 with these values
or any other key to enter new values
a

Set si570 Reg 07 <Current edit: 0x01> 0x60
Set si570 Reg 08 <Current edit: 0xC2> 0xC3
Set si570 Reg 09 <Current edit: 0xBB> 0x0F
Set si570 Reg 10 <Current edit: 0xFE> 0xFE
Set si570 Reg 11 <Current edit: 0x48> 0x13
Set si570 Reg 12 <Current edit: 0x7F> 0xD8
Current si570 register 07 = 0x60
Current si570 register 08 = 0xC3
Current si570 register 09 = 0x0F
Current si570 register 10 = 0xFE
Current si570 register 11 = 0x13
Current si570 register 12 = 0xD8
Press w to WRITE si570 with these values
or any other key to enter new values
```

# AC701 Si570 Programming

- Si570 has been successfully updated

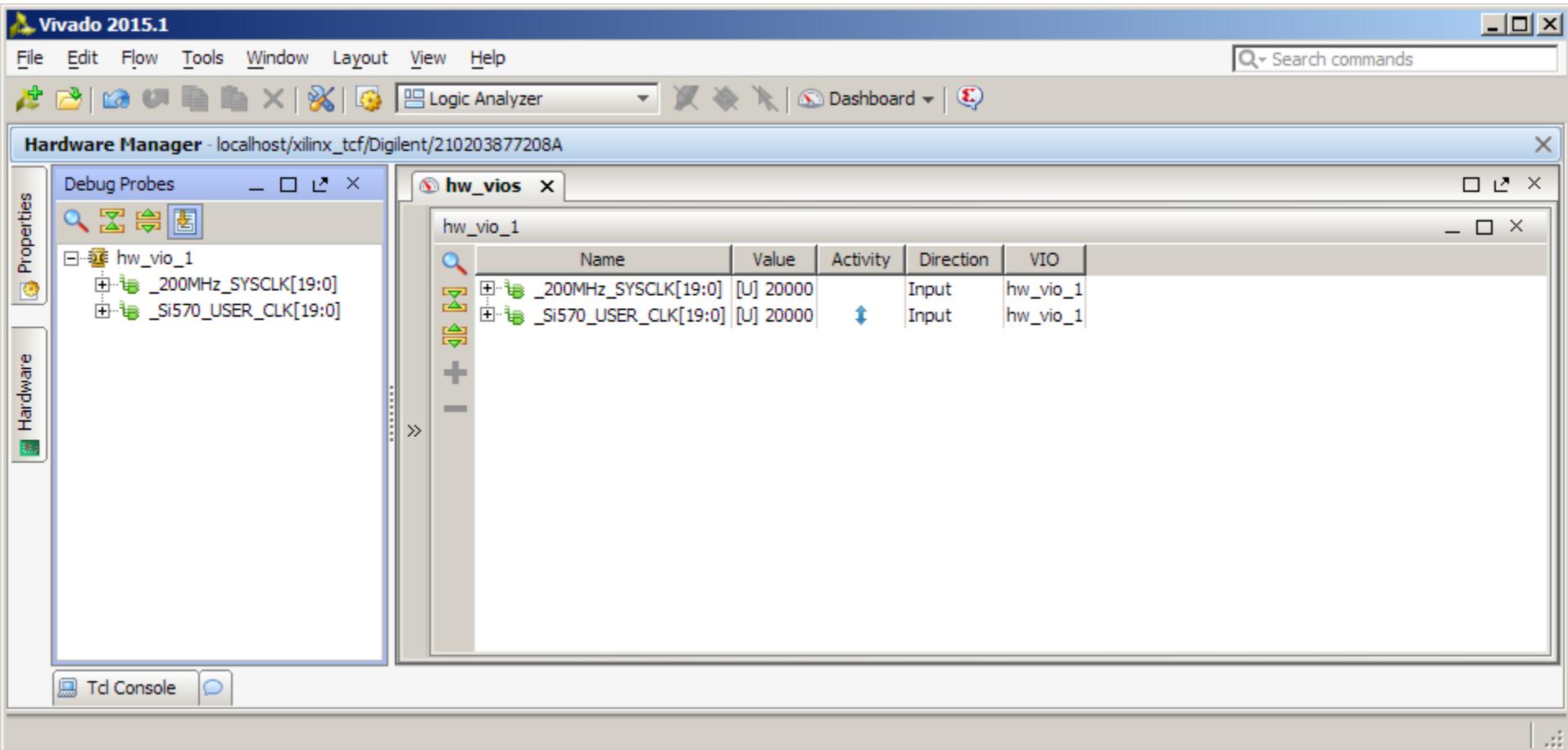


The screenshot shows a terminal window titled "COM2:9600baud - Tera Term VT". The window displays the following text:

```
Current si570 register 07 = 0x60
Current si570 register 08 = 0xC3
Current si570 register 09 = 0x0F
Current si570 register 10 = 0xFE
Current si570 register 11 = 0x13
Current si570 register 12 = 0xD8
Press w to WRITE si570 with these values
or any other key to enter new values
w
WRITED si570 register 07 = 0x60
WRITED si570 register 08 = 0xC3
WRITED si570 register 09 = 0x0F
WRITED si570 register 10 = 0xFE
WRITED si570 register 11 = 0x13
WRITED si570 register 12 = 0xD8
Reading data from Si570
ReadBuffer[00] = 60
ReadBuffer[01] = C3
ReadBuffer[02] = 0F
ReadBuffer[03] = FE
ReadBuffer[04] = 13
ReadBuffer[05] = D8
Si570 Updated
```

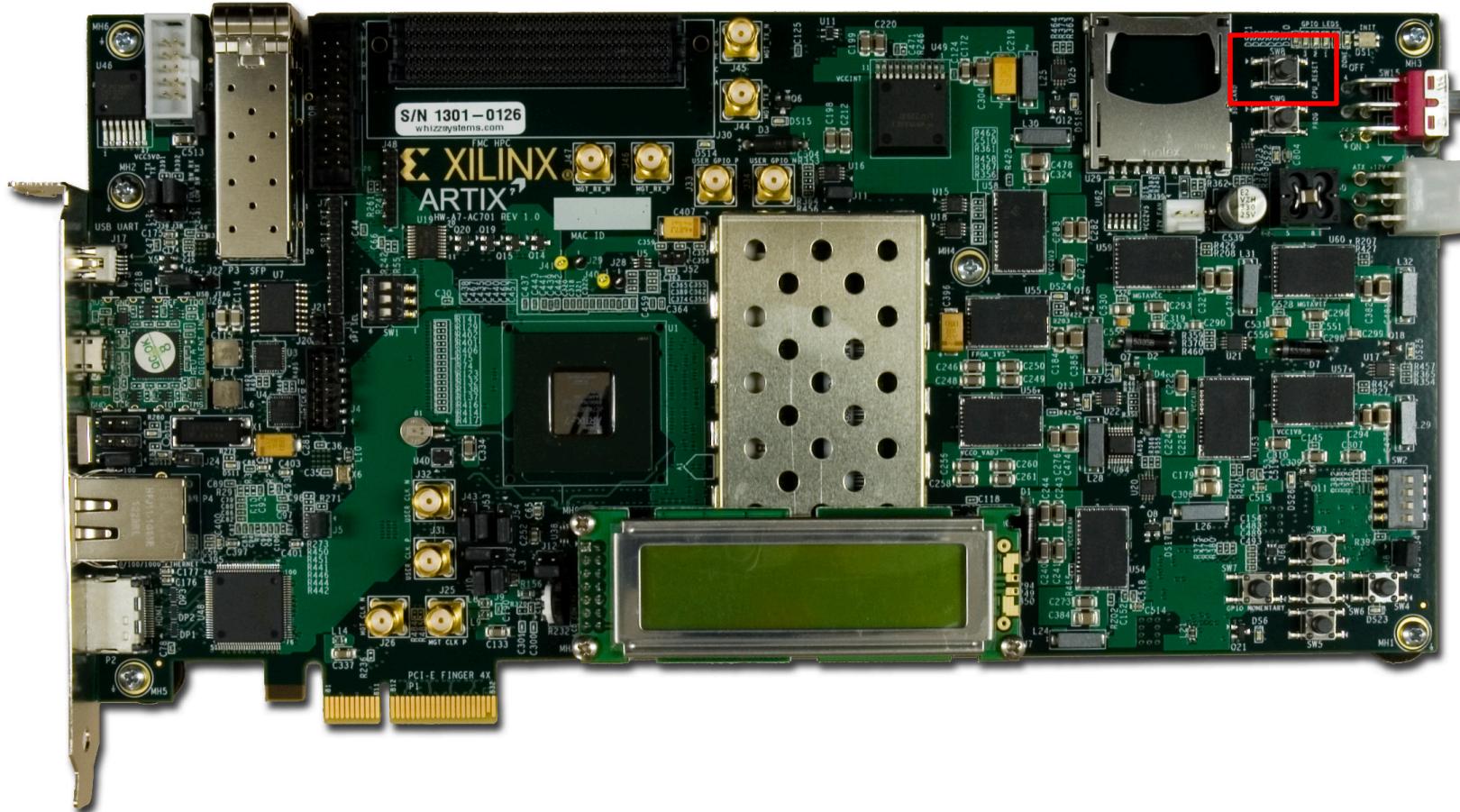
# AC701 Si570 Programming

► The Si570 User Clock now shows 200.00 MHz



# AC701 Si570 Programming

- If needed, press SW8 to reset the MicroBlaze process
  - Instead of reloading the bitstream; also acts as a CPU Reset



# **Programming the FMC Si570**

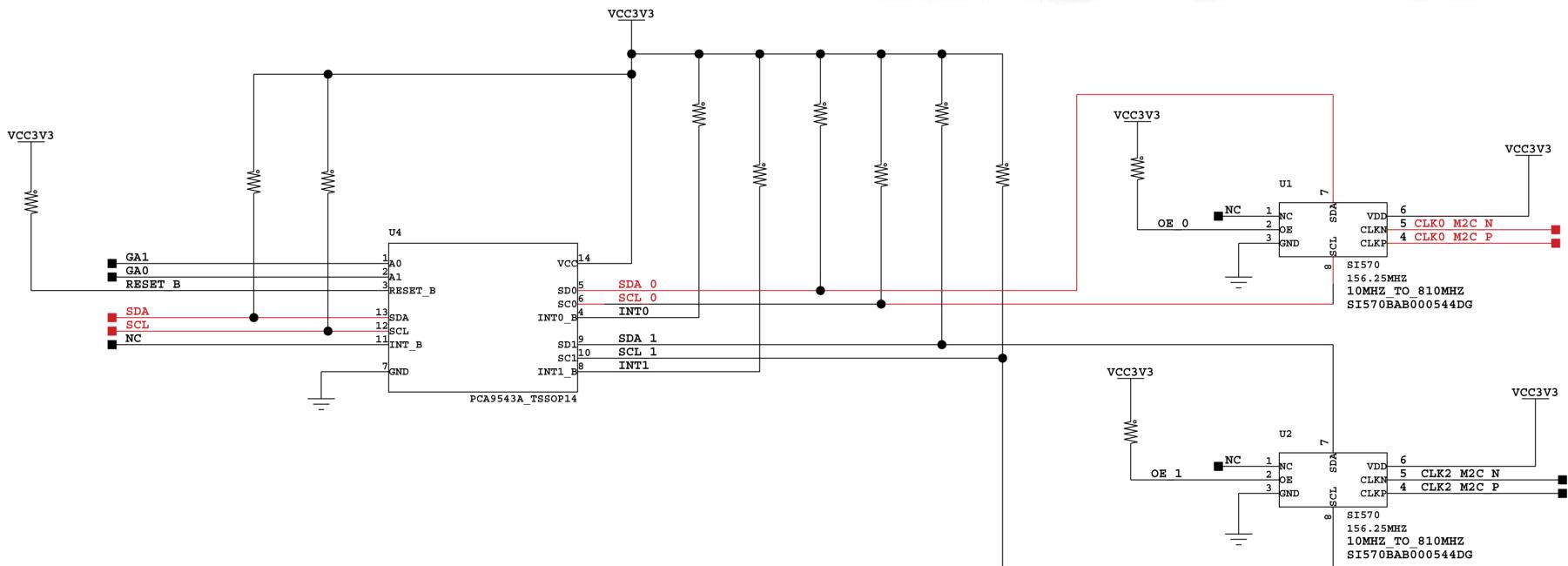
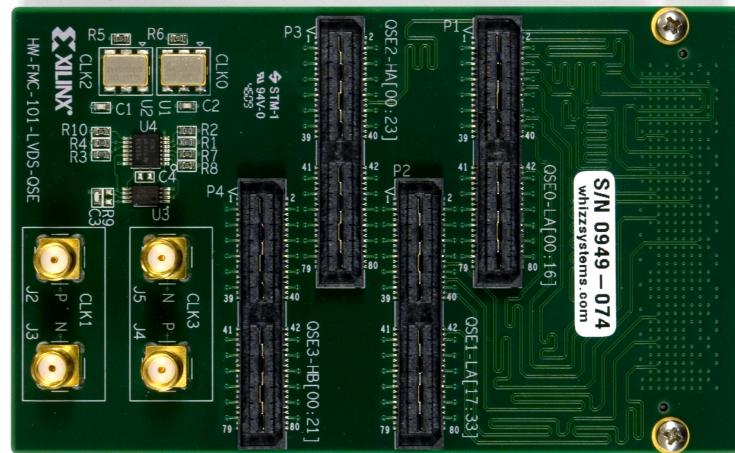
# AC701 FMC Si570 Programming Overview

## ► Description

- The FMC modules, XM101, XM104, and XM105 have a Silicon Labs Si570 Programmable Oscillator that defaults to 156.25 MHz. Via the IIC bus, the frequency of this device can be changed. This tutorial shows how to change the output frequency of this device.

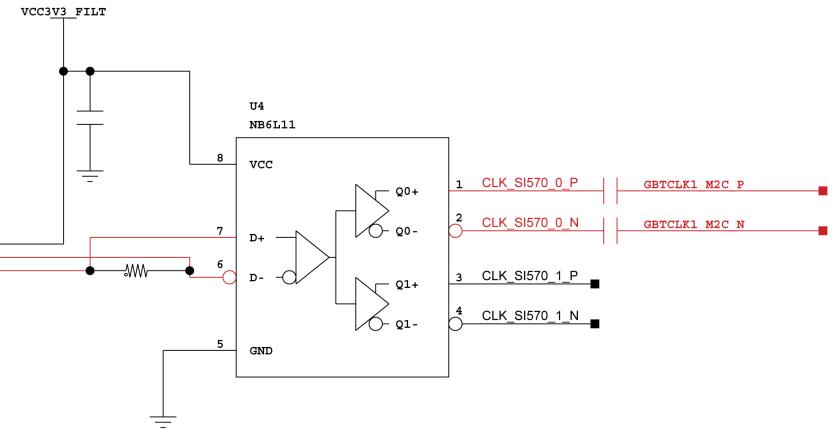
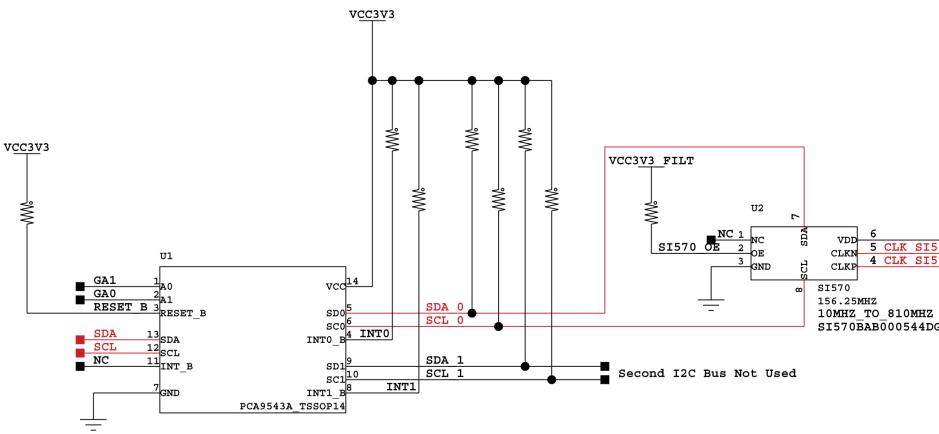
# Xilinx XM101 FMC Module

► The XM101 board uses an on-board I<sup>C</sup> switch



# Xilinx XM104 FMC Module

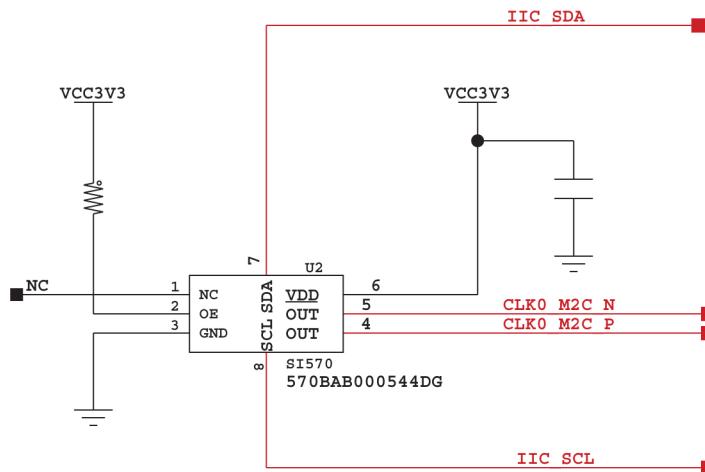
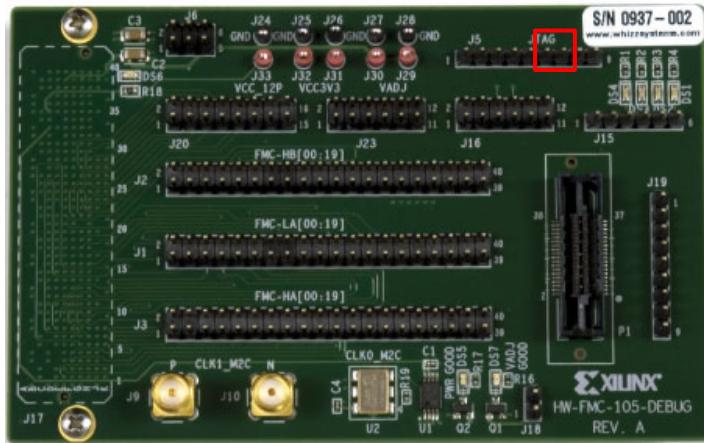
- The XM104 board has an on-board IIC switch



# Xilinx XM105 FMC Module

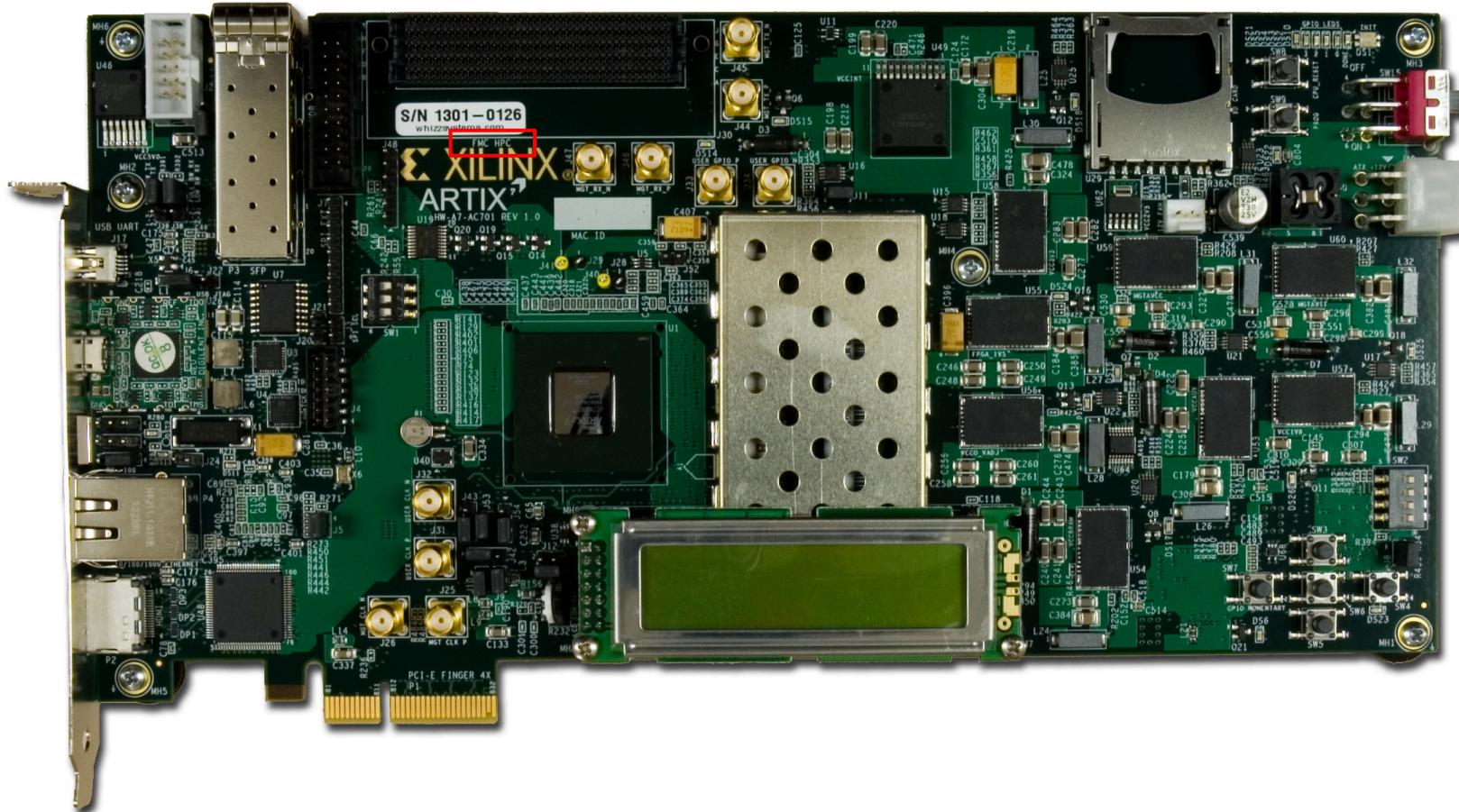
► The XM105 board has a direct connection to the Si570 IIC

- Note: FMC\_TDI and FMC\_TDO (J5, 6 & 7) must be connected during configuration



# AC701 FMC Si570 Programming

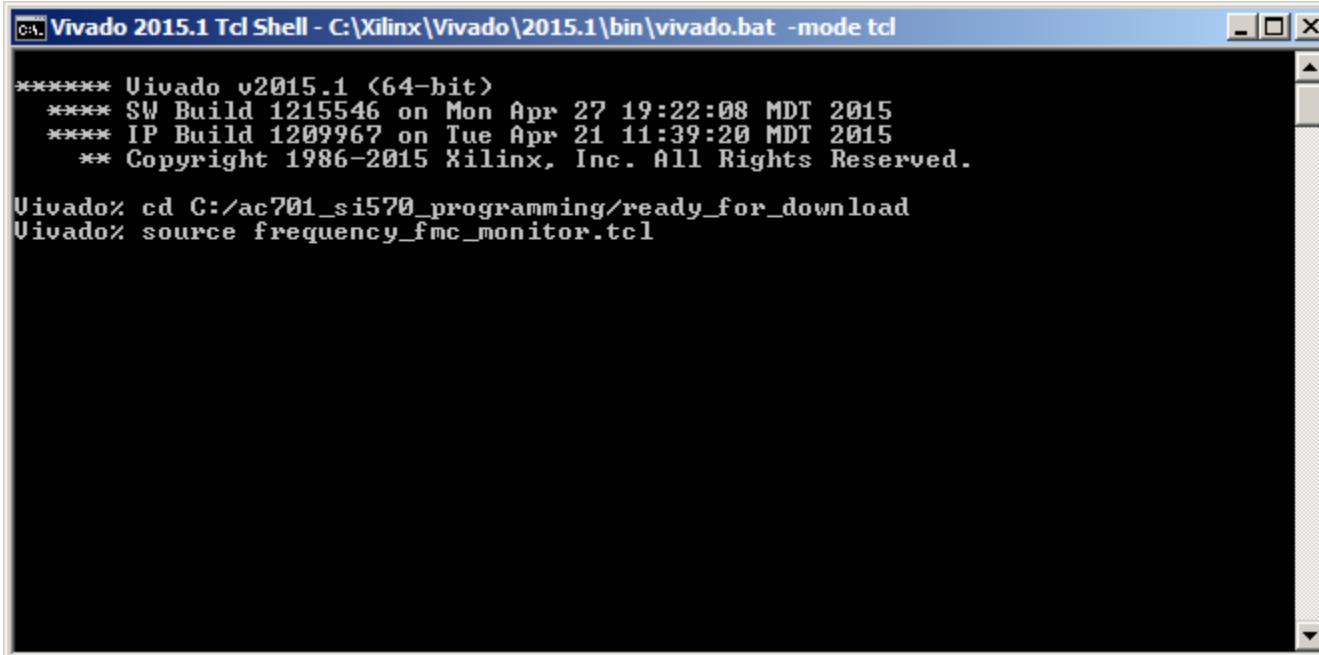
- Attach your FMC board (XM101, XM104, or XM105) to the FMC HPC expansion port on the AC701
  - Turn AC701 power off while installing the FMC boards



# AC701 FMC Si570 Programming

- ▶ For this example, an XM105 board has been connected to the FMC HPC port
- ▶ In a Vivado Tcl Shell type:

```
cd C:/ac701_si570_programming/ready_for_download  
source frequency_fmc_monitor.tcl
```

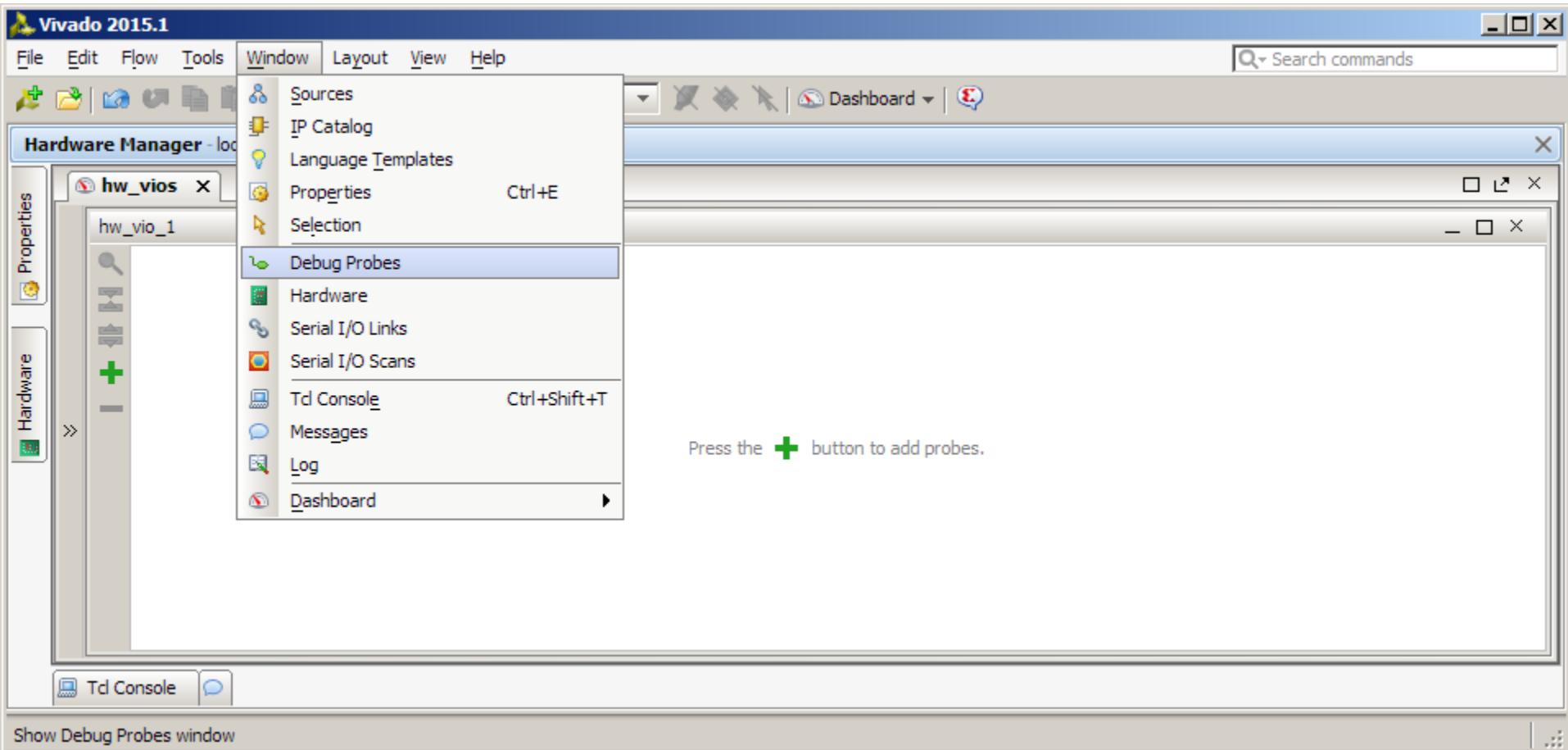


The screenshot shows a terminal window titled "Vivado 2015.1 Tcl Shell - C:\Xilinx\Vivado\2015.1\bin\vivado.bat -mode tcl". The window displays the following text:

```
***** Vivado v2015.1 (64-bit)  
**** SW Build 1215546 on Mon Apr 27 19:22:08 MDT 2015  
**** IP Build 1209967 on Tue Apr 21 11:39:20 MDT 2015  
** Copyright 1986-2015 Xilinx, Inc. All Rights Reserved.  
  
Vivado> cd C:/ac701_si570_programming/ready_for_download  
Vivado> source frequency_fmc_monitor.tcl
```

# AC701 FMC Si570 Programming

## ► Open the Debug Probes



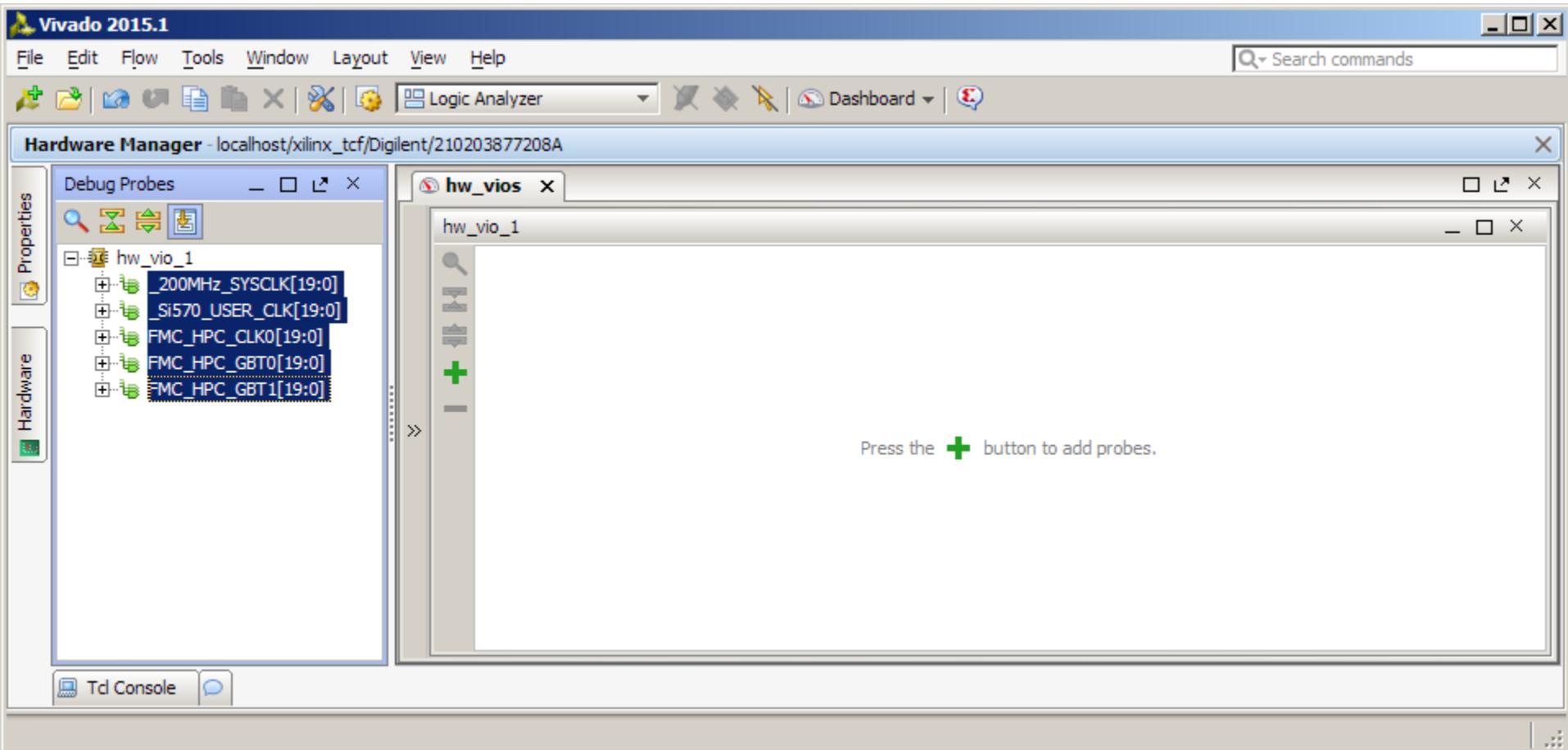
Note: Presentation applies to the AC701

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# AC701 FMC Si570 Programming

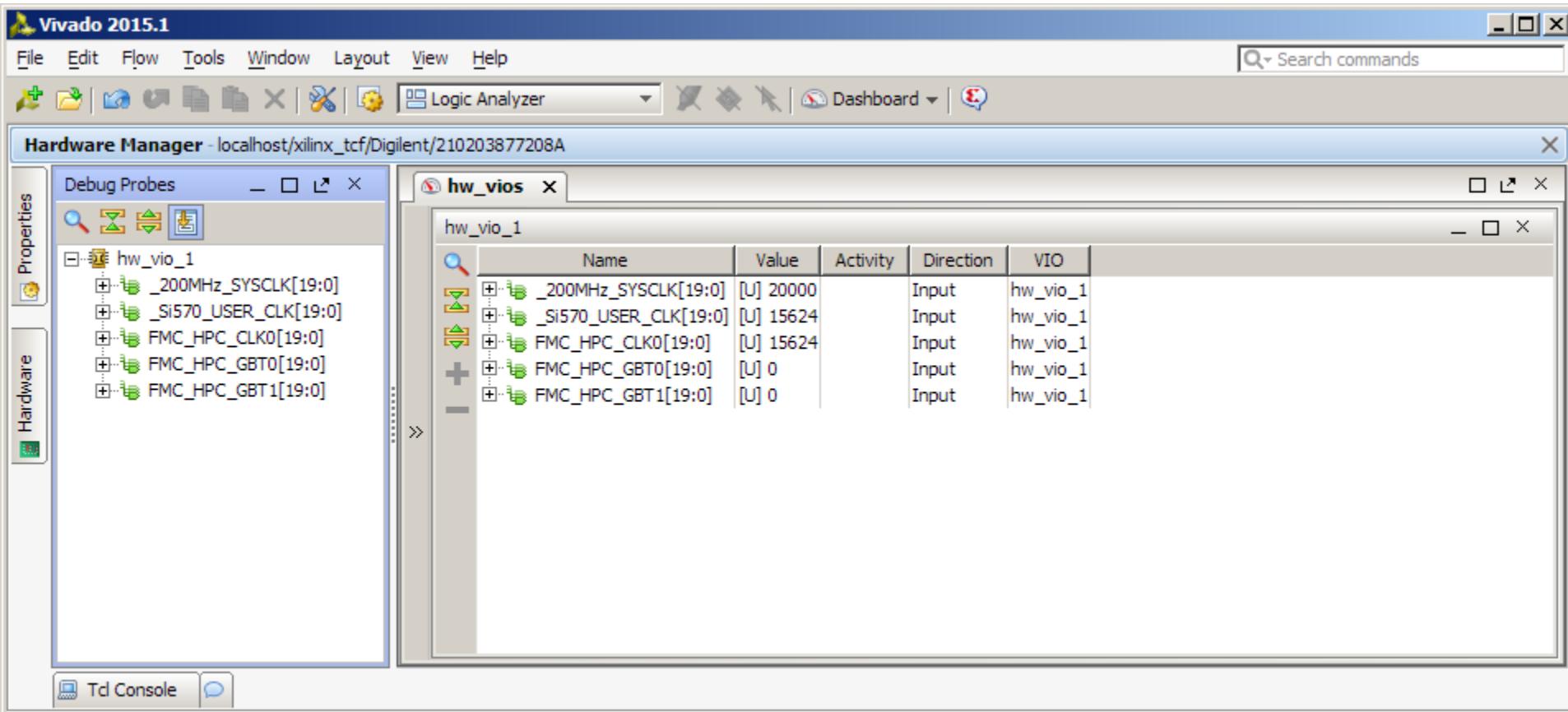
## ► View the Debug Probes

- Select the probes and drag to the **hw\_vios** tab



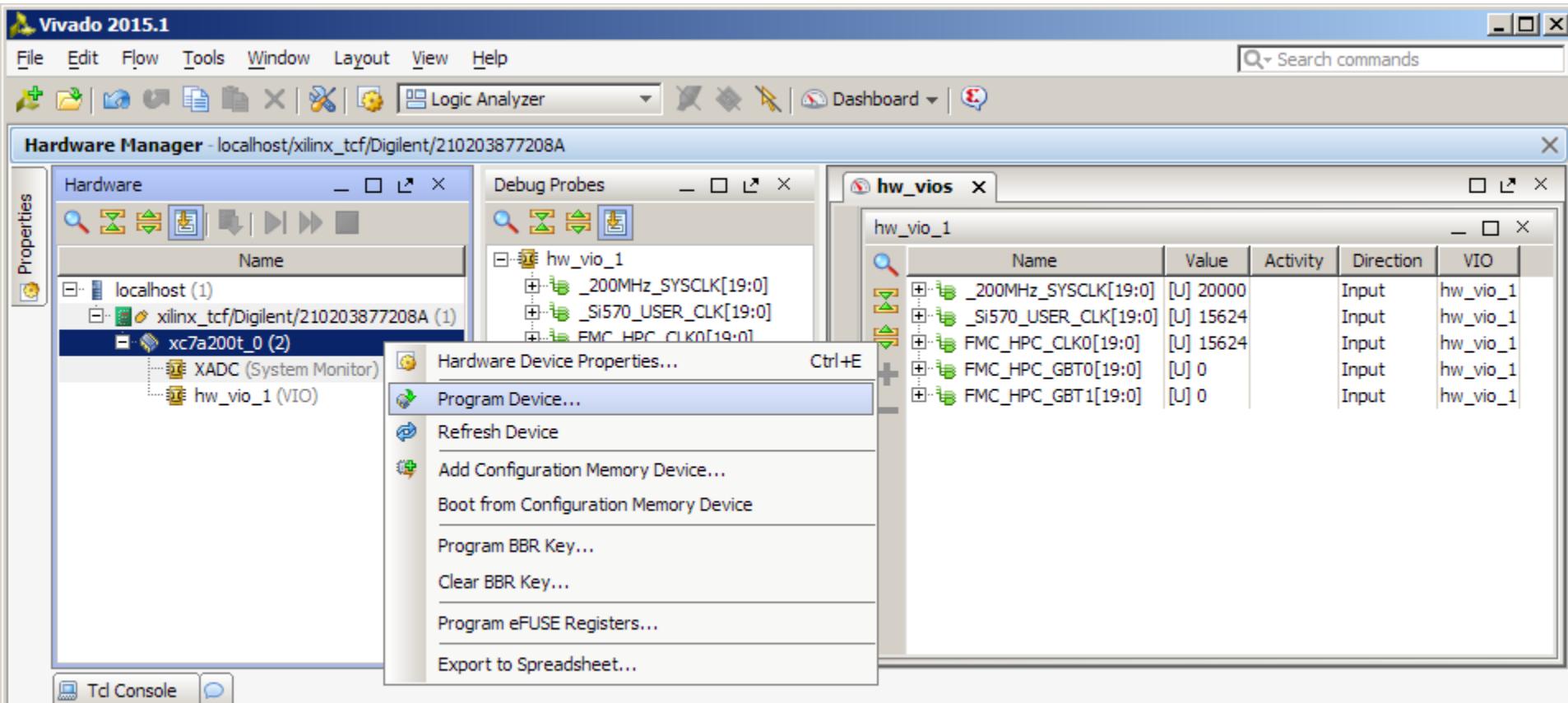
# AC701 FMC Si570 Programming

- An XM105 board on the FMC HPC port shows 156.25 MHz on FMC\_HPC\_CLK0



# AC701 FMC Si570 Programming

► Under Hardware, right click on the xc7a200t\_0 and select Program Device...



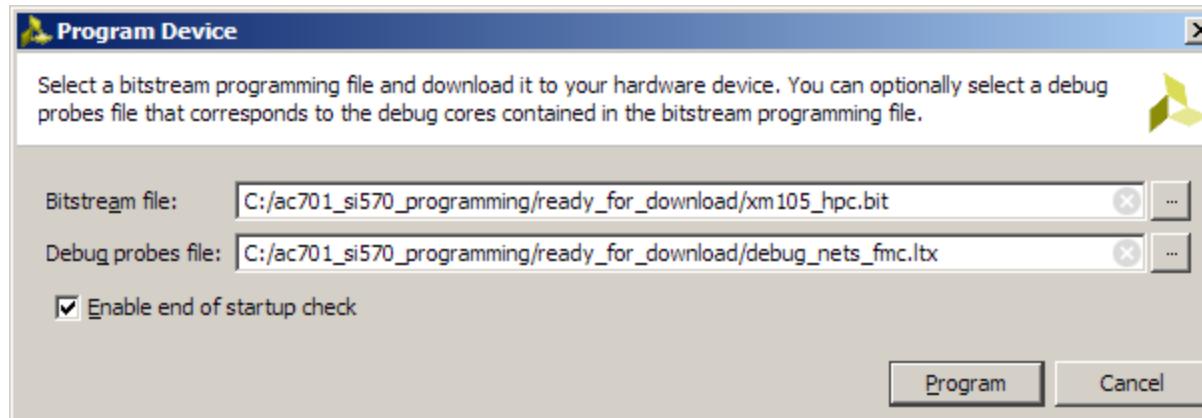
Program hardware device with specified bitstream

Note: Presentation applies to the AC701

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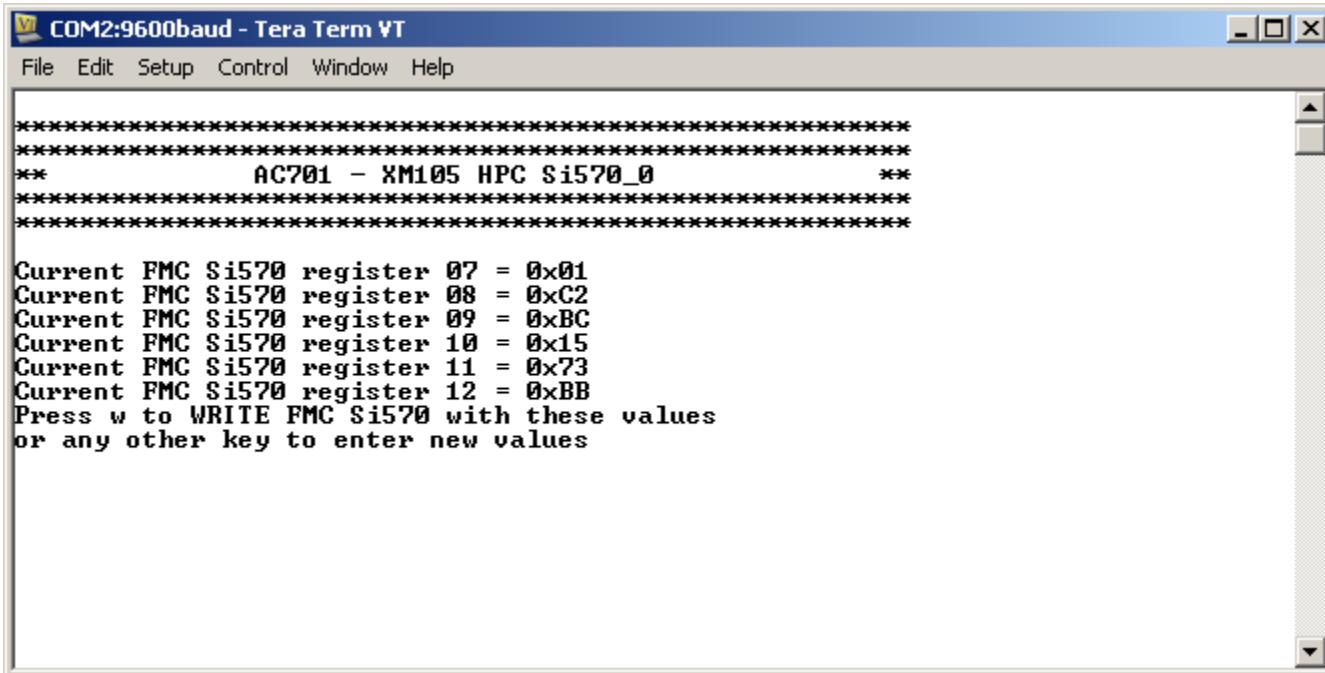
# AC701 FMC Si570 Programming

- Select a bitstream that matches your FMC Board / FMC port configuration; e.g. xm101\_hpc.bit, xm104\_lpc.bit, etc.
  - Also select the Debug Probes file, debug\_nets\_fmc.ltx



# AC701 FMC Si570 Programming

- The terminal window shows the current register settings for the Si570
  - The power-on values will appear in the terminal window
  - Note the value of **0x01C2BC1573BB**



The screenshot shows a terminal window titled "COM2:9600baud - Tera Term VT". The window displays the following text:

```
*****
**          AC701 - XM105 HPC Si570_0      **
*****
Current FMC Si570 register 07 = 0x01
Current FMC Si570 register 08 = 0xC2
Current FMC Si570 register 09 = 0xBC
Current FMC Si570 register 10 = 0x15
Current FMC Si570 register 11 = 0x73
Current FMC Si570 register 12 = 0xBB
Press w to WRITE FMC Si570 with these values
or any other key to enter new values
```

**Note:** The values reported by your Si570 may differ from those shown

# AC701 FMC Si570 Programming

- Use the Si570 Calibration procedure, noted earlier in this document to determine the values to enter
- Press a key to begin entering the newly calculated values
- When done, press “w”

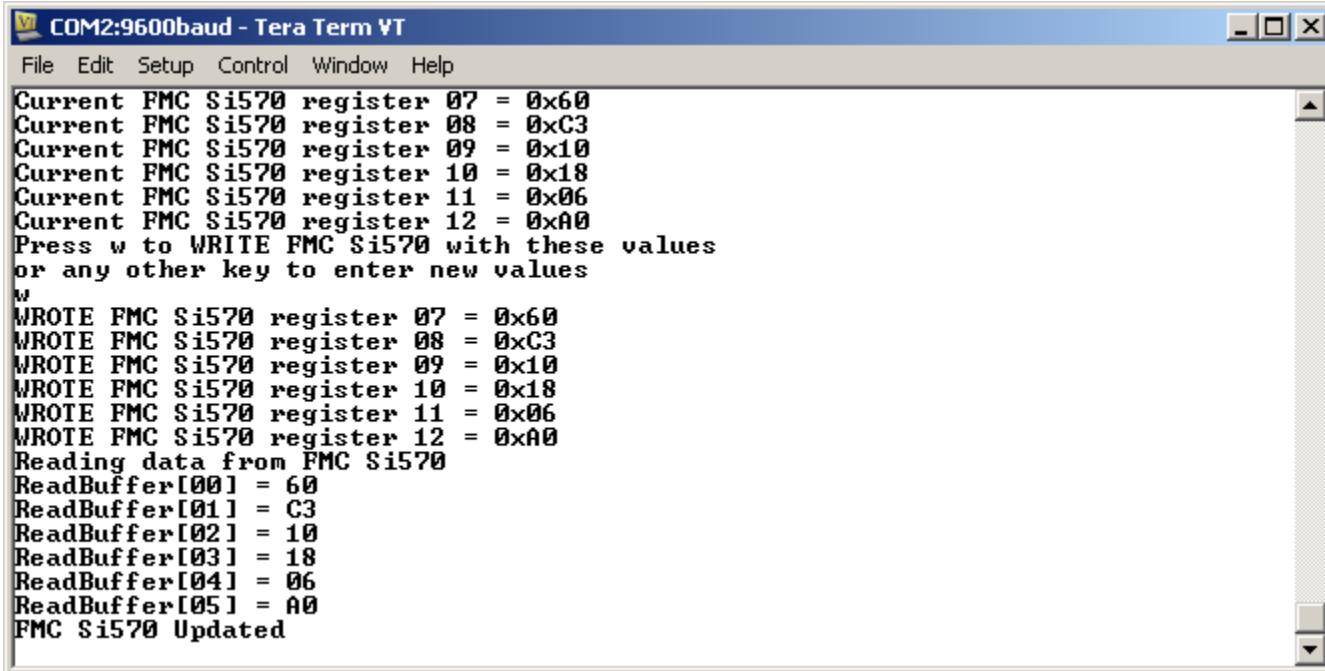
The screenshot shows a terminal window titled "COM2:9600baud - Tera Term VT". The window displays the following text:

```
File Edit Setup Control Window Help
Current FMC Si570 register 08 = 0xC2
Current FMC Si570 register 09 = 0xBC
Current FMC Si570 register 10 = 0x15
Current FMC Si570 register 11 = 0x73
Current FMC Si570 register 12 = 0xBB
Press w to WRITE FMC Si570 with these values
or any other key to enter new values
a

Set FMC Si570 Reg 07 <Current edit: 0x01>> 0x60
Set FMC Si570 Reg 08 <Current edit: 0xC2>> 0xC3
Set FMC Si570 Reg 09 <Current edit: 0xBC>> 0x10
Set FMC Si570 Reg 10 <Current edit: 0x15>> 0x18
Set FMC Si570 Reg 11 <Current edit: 0x73>> 0x06
Set FMC Si570 Reg 12 <Current edit: 0xBB>> 0xA0
Current FMC Si570 register 07 = 0x60
Current FMC Si570 register 08 = 0xC3
Current FMC Si570 register 09 = 0x10
Current FMC Si570 register 10 = 0x18
Current FMC Si570 register 11 = 0x06
Current FMC Si570 register 12 = 0xA0
Press w to WRITE FMC Si570 with these values
or any other key to enter new values
```

# AC701 FMC Si570 Programming

- Si570 has been successfully updated

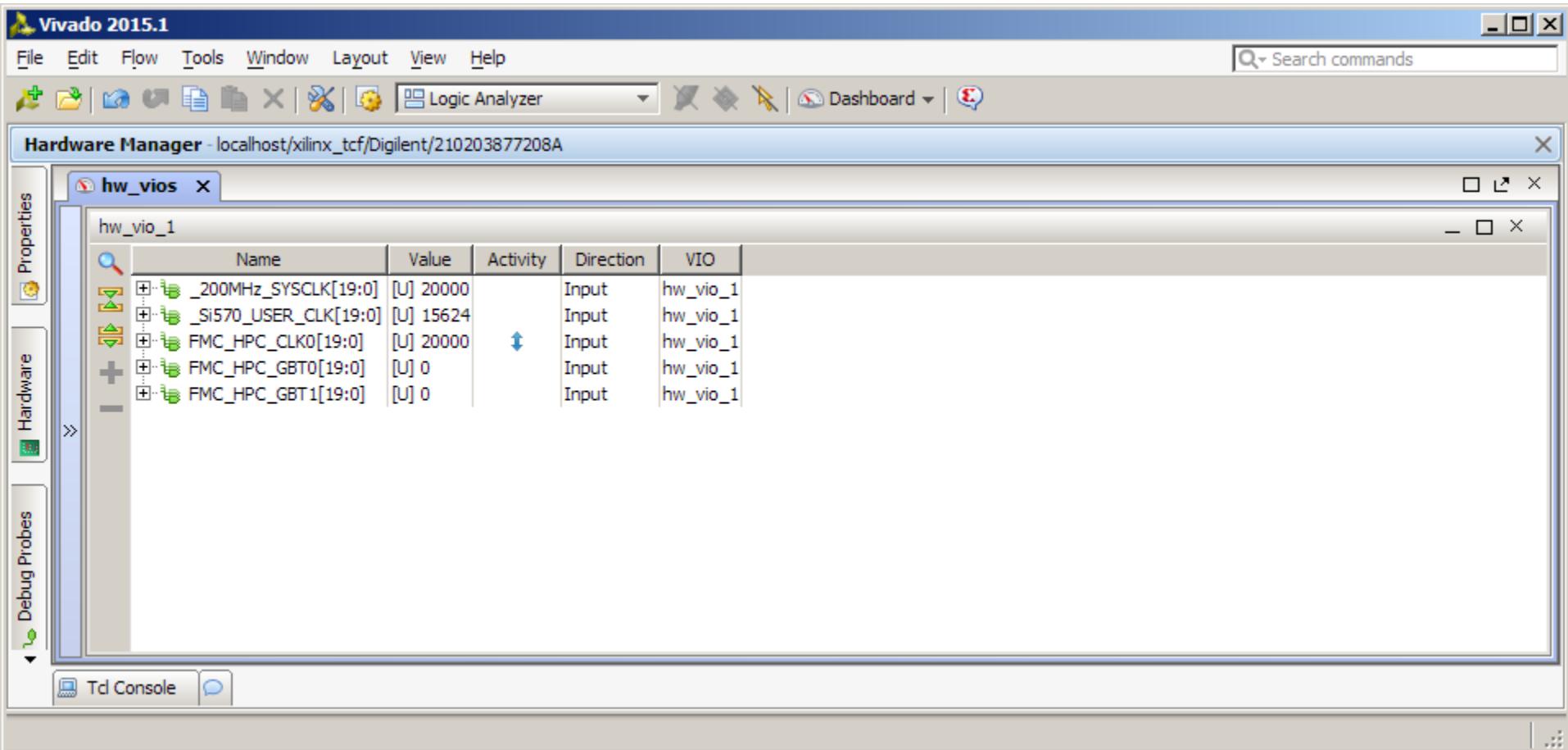


COM2:9600baud - Tera Term VT

```
File Edit Setup Control Window Help
Current FMC Si570 register 07 = 0x60
Current FMC Si570 register 08 = 0xC3
Current FMC Si570 register 09 = 0x10
Current FMC Si570 register 10 = 0x18
Current FMC Si570 register 11 = 0x06
Current FMC Si570 register 12 = 0xA0
Press w to WRITE FMC Si570 with these values
or any other key to enter new values
w
WRITED FMC Si570 register 07 = 0x60
WRITED FMC Si570 register 08 = 0xC3
WRITED FMC Si570 register 09 = 0x10
WRITED FMC Si570 register 10 = 0x18
WRITED FMC Si570 register 11 = 0x06
WRITED FMC Si570 register 12 = 0xA0
Reading data from FMC Si570
ReadBuffer[00] = 60
ReadBuffer[01] = C3
ReadBuffer[02] = 10
ReadBuffer[03] = 18
ReadBuffer[04] = 06
ReadBuffer[05] = A0
FMC Si570 Updated
```

# AC701 FMC Si570 Programming

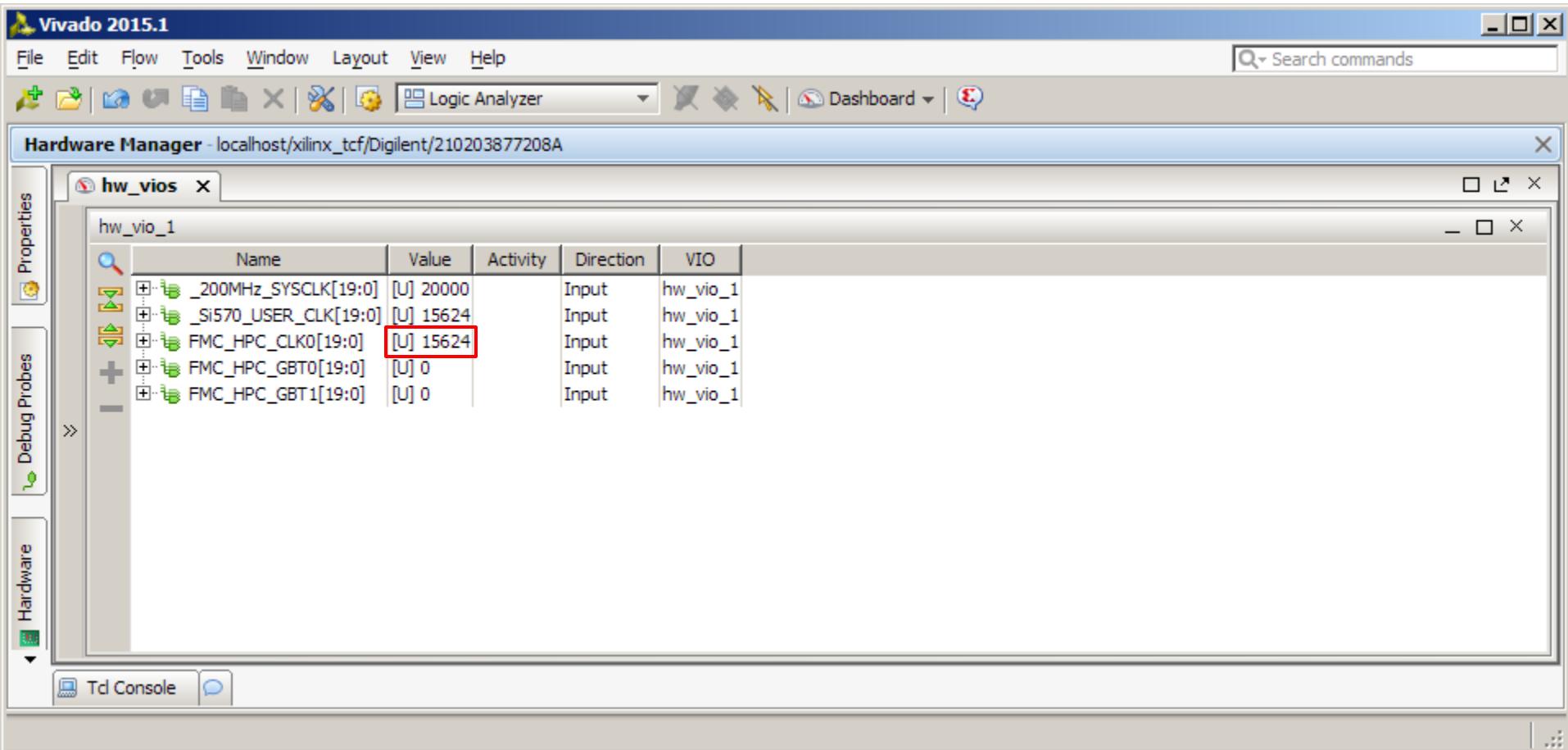
► The XM105 board on FMC HPC now shows 200 MHz



# **AC701 with FMC XM Boards**

# AC701 with FMC XM Boards

## ► AC701 with XM101 on the FMC HPC port



# AC701 with FMC XM Boards

## ► AC701 with XM104 on the FMC HPC port

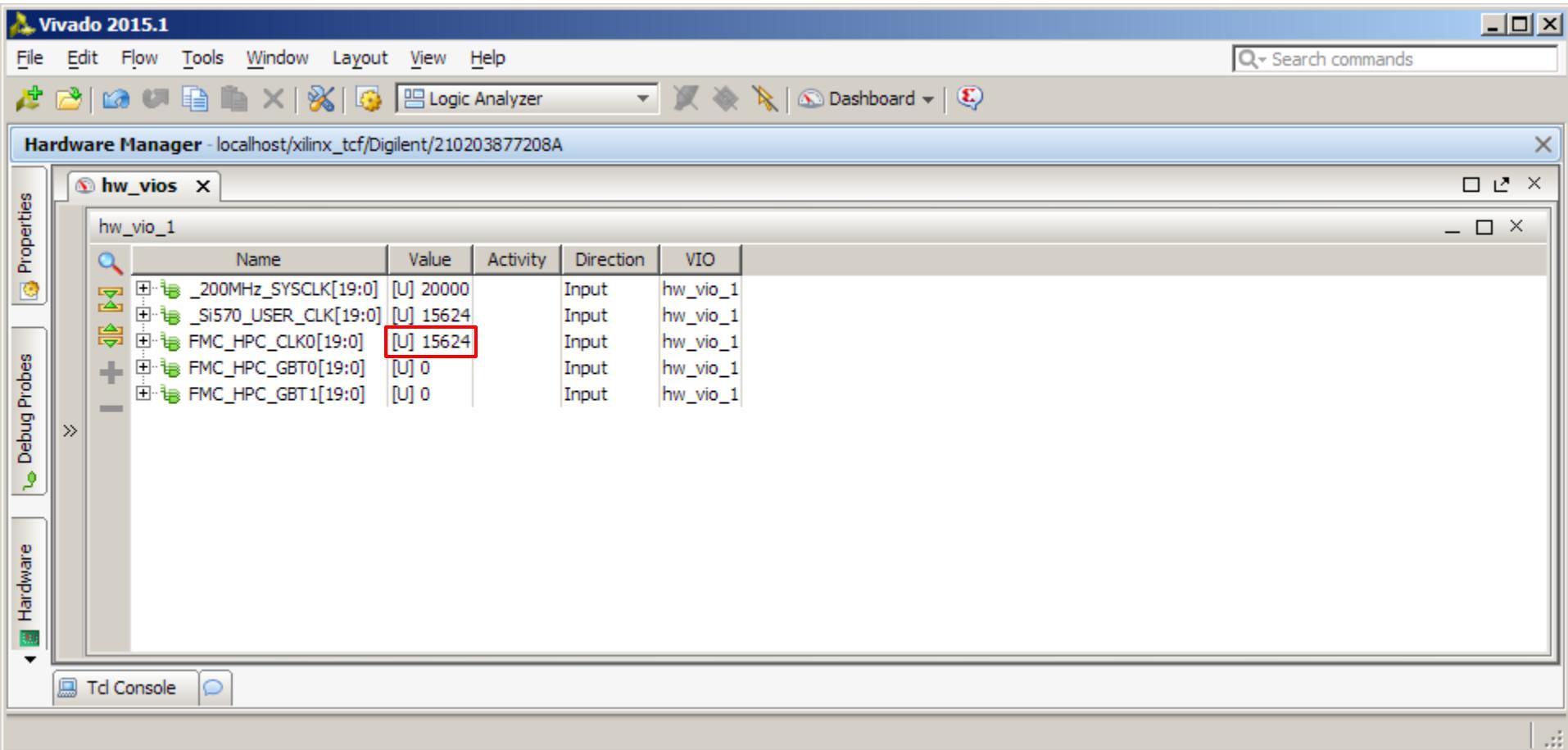
The screenshot shows the Vivado 2015.1 Hardware Manager interface. The main window displays a table of hardware pins under the tab 'hw\_vios'. The table has columns for Name, Value, Activity, Direction, and VIO. The 'hw\_vios' tab is selected, and the table shows the following data:

Name	Value	Activity	Direction	VIO
_200MHz_SYSCLK[19:0]	[U] 20000		Input	hw_vio_1
_Si570_USER_CLK[19:0]	[U] 15624		Input	hw_vio_1
FMC_HPC_CLK0[19:0]	[U] 0		Input	hw_vio_1
FMC_HPC_GBT0[19:0]	[U] 0		Input	hw_vio_1
FMC_HPC_GBT1[19:0]	[U] 15624		Input	hw_vio_1

The value for the FMC\_HPC\_GBT1 pin is highlighted with a red box. The left sidebar shows tabs for Properties, Debug Probes, and Hardware. The bottom navigation bar includes Tcl Console and a message center icon.

# AC701 with FMC XM Boards

## ► AC701 with XM105 on the FMC HPC port



## References

# References

## ► FMC XM101 Documentation

- FMC XM101 LVDS QSE Mezzanine Card
  - <http://www.xilinx.com/products/boards-and-kits/hw-fmc-xm101-g.html>
- FMC XM101 LVDS QSE Mezzanine Card User Guide – UG538
  - [http://www.xilinx.com/support/documentation/boards\\_and\\_kits/ug538.pdf](http://www.xilinx.com/support/documentation/boards_and_kits/ug538.pdf)

## ► FMC XM104 Documentation

- FMC XM104 Connectivity Card
  - <http://www.xilinx.com/products/boards-and-kits/hw-fmc-xm104-g.html>
- FMC XM104 Connectivity Card User Guide – UG536
  - [http://www.xilinx.com/support/documentation/boards\\_and\\_kits/ug536.pdf](http://www.xilinx.com/support/documentation/boards_and_kits/ug536.pdf)

## ► FMC XM105 Documentation

- FMC XM105 Debug Card
  - <http://www.xilinx.com/products/boards-and-kits/hw-fmc-xm105-g.html>
- FMC XM105 Debug Card User Guide – UG537
  - [http://www.xilinx.com/support/documentation/boards\\_and\\_kits/ug537.pdf](http://www.xilinx.com/support/documentation/boards_and_kits/ug537.pdf)

# References

## ➤ Silicon Labs

- Si570 Data Sheet
  - <http://www.silabs.com/Support%20Documents/TechnicalDocs/si570.pdf>

## ➤ Vivado Programming and Debugging

- Vivado Design Suite Programming and Debugging User Guide – UG908
  - [http://www.xilinx.com/support/documentation/sw\\_manuals/xilinx2015\\_1/ug908-vivado-programming-debugging.pdf](http://www.xilinx.com/support/documentation/sw_manuals/xilinx2015_1/ug908-vivado-programming-debugging.pdf)

# Documentation

# Documentation

## ➤ Artix-7

- Artix-7 FPGA Family
  - <http://www.xilinx.com/products/silicon-devices/fpga/artix-7/index.htm>
- Design Advisory Master Answer Record for Artix-7 FPGAs
  - <http://www.xilinx.com/support/answers/51456.htm>

## ➤ AC701 Documentation

- Artix-7 FPGA AC701 Evaluation Kit
  - <http://www.xilinx.com/products/boards-and-kits/ek-a7-ac701-g.html>
- AC701 Getting Started Guide – UG967
  - [http://www.xilinx.com/support/documentation/boards\\_and\\_kits/ac701/2014\\_3/ug967-ac701-eval-kit-getting-started.pdf](http://www.xilinx.com/support/documentation/boards_and_kits/ac701/2014_3/ug967-ac701-eval-kit-getting-started.pdf)
- AC701 User Guide – UG952
  - [http://www.xilinx.com/support/documentation/boards\\_and\\_kits/ac701/ug952-ac701-a7-eval-bd.pdf](http://www.xilinx.com/support/documentation/boards_and_kits/ac701/ug952-ac701-a7-eval-bd.pdf)