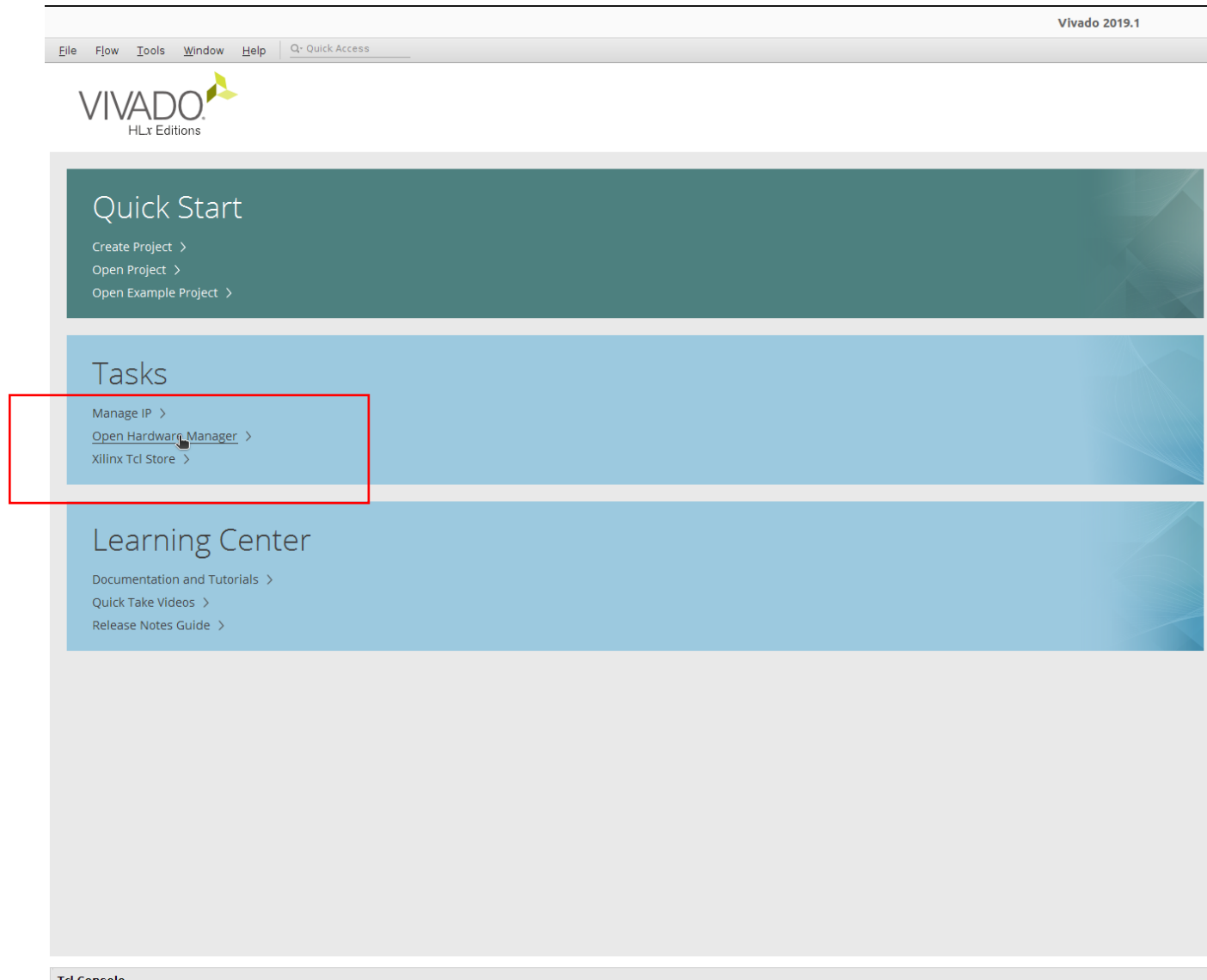


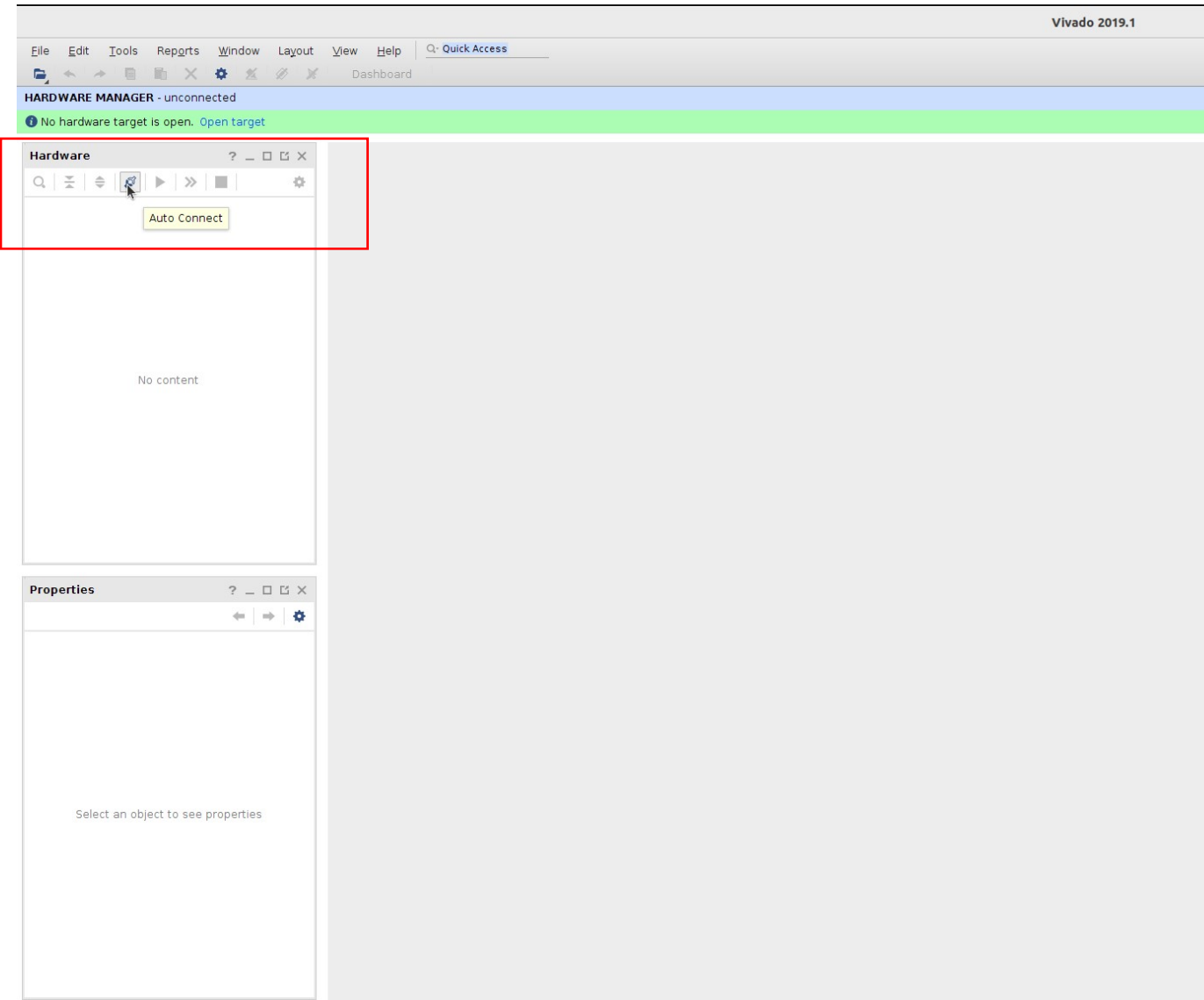
Flashing the Spartan-7 hybrid using Xilinx Vivado

Step 0: Connect the JTAG between hybrid and computer and power the hybrid with the correct voltages.

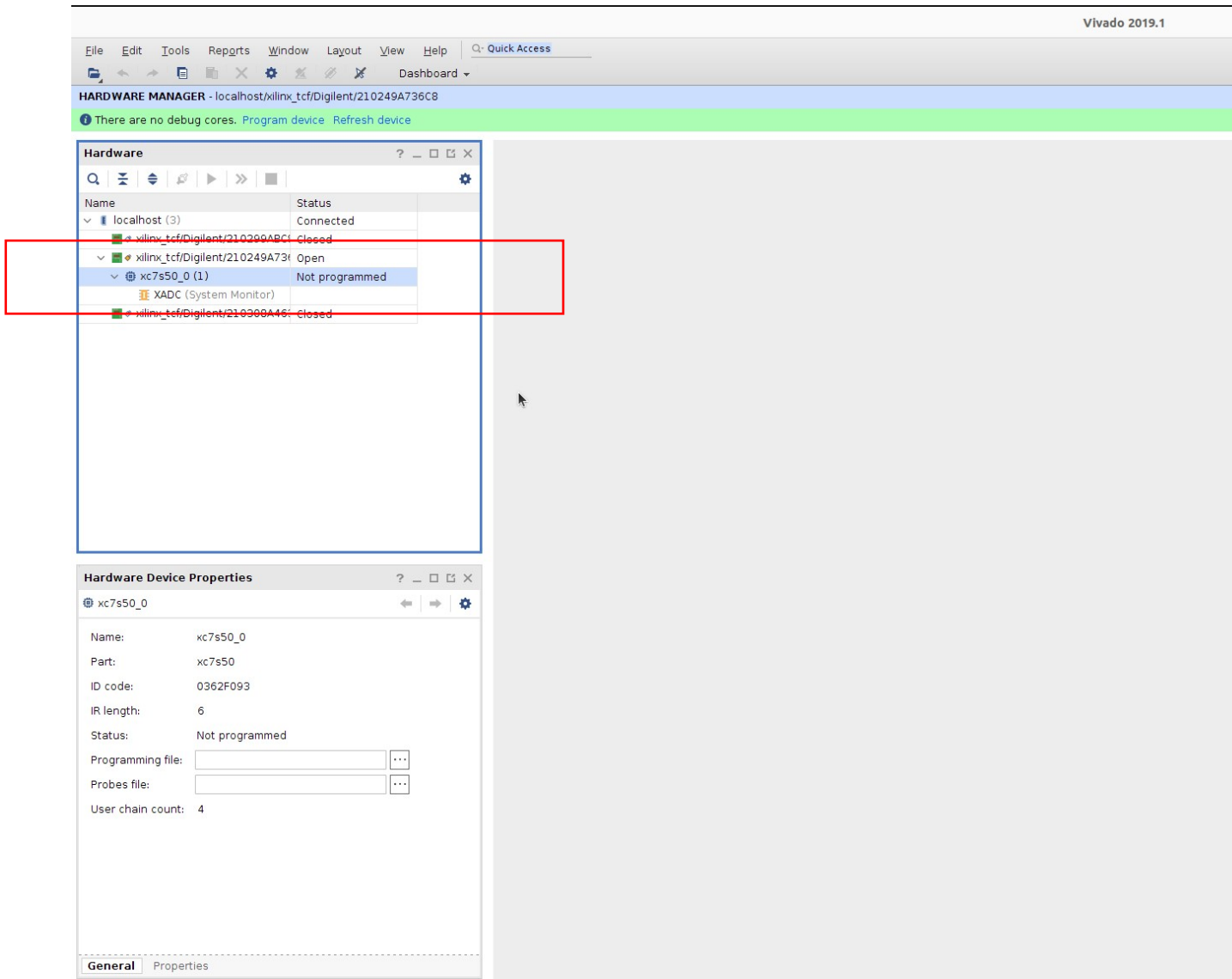
Step 1: Open Vivado and press “Open Hardware Manager”



Step 2: "Auto Connect"



Step 3: Select your Spartan-7 device



Step 4: Write memory configuration file with the settings as shown in the screenshot

The screenshot displays the Vivado 2019.1 interface. The 'Hardware Manager' pane on the left shows a tree view of the hardware components, with 'xc7s50_0 (1)' selected. The 'Hardware Device Properties' pane below it shows details for 'xc7s50_0', including Name, Part, ID code, IR length, Status, Programming file, Probes file, and User chain count.

The 'Write Memory Configuration File' dialog is open, showing the following settings:

- Format: MCS
- Memory Part: (selected)
- Custom Memory Size (MB): 2
- Filename: (empty)
- Interface: SMAPx8
- Load bitstream files: (unchecked)
- Daisy chain configuration file: (unchecked)
- Start address: 00000000, Direction: up, Bitfile: (empty)
- Load data files: (unchecked)
- Start address: 00000000, Direction: up, Datafile: (empty)
- Write checksum: (unchecked)
- Disable bit swapping: (unchecked)
- Overwrite: (unchecked)
- Command: write_cfgmem -format mcs -size 2 -interface SMAPx8

The 'Select Configuration Memory Part' dialog is also open, showing a table of configuration memory parts. The table has columns for Name, Part, Manufact..., Alias, Family, and Type. The row for 's25f1128l-spi-x1_x2_x4' is highlighted, and a red box highlights the filter settings: Manufacturer: Spansion, Density (Mb): All, Type: All, Width: All.

Name	Part	Manufact...	Alias	Family	Type
s25f1032p-spi-x1_x2_x4	s25f1032p	Spansion		s25f1032p	spi
s25f1064l-spi-x1_x2_x4	s25f1064l	Spansion		s25f1064l	spi
s25f1064p-spi-x1_x2_x4	s25f1064p	Spansion		s25f1064p	spi
s25f116k-spi-x1_x2_x4	s25f116k	Spansion		s25f116k	spi
s25f1128l-spi-x1_x2_x4	s25f1128l	Spansion		s25f1128l	spi
s25f128sxxxxxxx0-spi-x1_x2_x4	s25f128sxxxxxxx0	Spansion	s25f127c-spi-x1_x2_x4	s25f128s	spi
s25f128sxxxxxxx1-spi-x1_x2_x4	s25f128sxxxxxxx1	Spansion		s25f128s	spi
s25f132k-spi-x1_x2_x4	s25f132k	Spansion		s25f132k	spi
s25f164k-spi-x1_x2_x4	s25f164k	Spansion		s25f164k	spi
s25f1256l-spi-x1_x2_x4	s25f1256l	Spansion		s25f1256l	spi
s25f1256sxxxxxxx0-spi-x1_x2_x4	s25f1256sxxxxxxx0	Spansion		s25f1256s	spi
s25f1256sxxxxxxx1-spi-x1_x2_x4	s25f1256sxxxxxxx1	Spansion		s25f1256s	spi
s25f1512s-spi-x1_x2_x4	s25f1512s	Spansion		s25f1512s	spi

Step 5: Press ok

Vivado 2019.1

File Edit Tools Reports Window Layout View Help Quick Access

Dashboard

HARDWARE MANAGER - localhost/xilinx_tcf/Digilent/210249A736C8

There are no debug cores. Program device Refresh device

Hardware

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC1	Closed
xilinx_tcf/Digilent/210249A736C8	Open
xc7s50_0 (1)	Not programmed
XADC (System Monitor)	
xilinx_tcf/Digilent/210308A461	Closed

Hardware Device Properties

xc7s50_0

Name: xc7s50_0
Part: xc7s50
ID code: 0362F093
IR length: 6
Status: Not programmed
Programming file: ...
Probes file: ...
User chain count: 4

Write Memory Configuration File

Create a configuration file to program the device

Format: MCS

Memory Part: s25fl128l-spi-x1_x2_x4

Custom Memory Size (MB): 1.6

Filename: /home/essdaq/tools/slow_control_vmm3a/Spartan7_vmm3a_hybrid_44p4.mcs

Options

Interface: SPIx4

Load bitstream files Daisy chain configuration file

Start address: 00000000 Direction: up Bitfile: /home/essdaq/tools/slow_control_vmm3a/Spartan7_vmm3a_hybrid_44p4.bit +

Load data files

Start address: 00000000 Direction: up Datafile: +

Write checksum
 Disable bit swapping
 Overwrite

Command: /tools/slow_control_vmm3a/Spartan7_vmm3a_hybrid_44p0_20230512.bit" -file "/home/essdaq/tools/slow_control_vmm3a/Spartan7_vmm3a_hybrid_44p4.mcs"

OK Cancel

Step 6: Press ok

Vivado 2019.1

File Edit Tools Reports Window Layout View Help Q Quick Access

Dashboard Default Layout

HARDWARE MANAGER - localhost/xilinx_tcf/Digilent/210249A736C8

There are no debug cores. Program device Refresh device

Hardware

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC1	Closed
xilinx_tcf/Digilent/210249A736C8	Open
xc7s50_0 (1)	Not programmed
XADC (System Monitor)	
xilinx_tcf/Digilent/210308A461	Closed

Hardware Device Properties

xc7s50_0

Name: xc7s50_0
Part: xc7s50
ID code: 0362F093
IR length: 6
Status: Not programmed
Programming file: ...
Probes file: ...
User chain count: 4

Generate Memory Configuration File

Generate memory configuration file completed successfully.

OK

Step 7: Add configuration memory device to Spartan-7 device

Vivado 2019.1

File Edit Tools Reports Window Layout View Help Quick Access

Dashboard

HARDWARE MANAGER - localhost/xilinx_tcf/Digilent/210249A736C8

There are no debug cores. Program device Refresh device

Hardware

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC1	Closed
xilinx_tcf/Digilent/210249A736C8	Open
xc7s50_0 (1)	Not programmed
XADC (System Monitor)	
xilinx_tcf/Digilent/210308A461	Closed

Hardware Device Properties

xc7s50_0

Name: xc7s50_0
Part: xc7s50
ID code: 0362F093
IR length: 6
Status: Not programmed
Programming file: ...
Probes file: ...
User chain count: 4

Add Configuration Memory Device

Choose a configuration memory part.

Device: xc7s50_0

Filter

Manufacturer: Spansion Type: All
Density (Mb): 128 Width: All
Reset All Filters

Select Configuration Memory Part

Search: Q:

Name	Part	Manufact...	Alias	Family	Type
s25fl128l-spi-x1_x2_x4	s25fl128l	Spansion		s25flxxx	spi
s25fl128sxxxxx0-spi-x1_x2_x4	s25fl128sxxxxx0	Spansion	s25fl127s-spi-x1_x2_x4	s25flxxxs	spi
s25fl128sxxxxx1-spi-x1_x2_x4	s25fl128sxxxxx1	Spansion		s25flxxxs	spi

OK Cancel

Step 8: The memory appears on the right. Confirm programming to flash.

The screenshot shows the Vivado 2019.1 interface. The top menu bar includes File, Edit, Tools, Reports, Window, Layout, View, and Help. Below the menu bar is a toolbar with icons for file operations and a search bar. The main window is titled "HARDWARE MANAGER - localhost/xilinx_tcf/Digilent/210249A736C8". A green status bar at the top of the hardware manager area displays the message: "There are no debug cores. Program device Refresh device".

The Hardware Manager window is divided into two panes. The left pane, titled "Hardware", contains a tree view of the hardware components. The right pane shows the details of the selected component. In the left pane, the component "s25fl128l-spi-x1_x2_x4" is selected and highlighted in blue. A red box highlights this component and the "XADC (System Monitor)" component above it. In the right pane, the "Configuration Memory Device Properties" window is open, showing the details for the selected component. A red box highlights this window.

The "Configuration Memory Device Properties" window displays the following information:

- Name: s25fl128l-spi-x1_x2_x4
- Memory Part: @s25fl128l-spi-x1_x2_x4
- Memory type: spi
- Memory density: 128
- Programming file: (empty field)

In the center of the screen, a dialog box titled "Add Configuration Memory Device Completed" is displayed. The dialog box contains the following text:

Do you want to program the configuration memory device now?

Don't show this dialog again

Buttons: OK, Cancel

A red box highlights the "OK" button in the dialog box.

Step 9: Check settings and confirm again

The screenshot shows the Vivado 2019.1 interface. The top menu bar includes File, Edit, Tools, Reports, Window, Layout, View, and Help. The main window displays the Hardware Manager, which is currently showing a list of hardware components. A dialog box titled "Program Configuration Memory Device" is open, allowing the user to select a configuration file and set programming options. The dialog box has several sections: "Memory Device" (set to s25fl128l-spi-x1_x2_x4), "Configuration file" (set to _vmm3a/Spartan7_vmm3a_hybrid_44p4.mcs), "PRM file" (empty), and "State of non-config mem I/O pins" (set to Pull-none). The "Program Operations" section includes checkboxes for Erase, Blank Check, Program, Verify, and Verify Checksum. The "SVF Options" section includes a checkbox for "Create SVF Only (no program operations)" and an "SVF File" field. The "OK" button is highlighted with a red box.

Hardware Manager - localhost/xilinx_tcf/Digilent/210249A736C8

There are no debug cores. [Program device](#) [Refresh device](#)

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC	Closed
xilinx_tcf/Digilent/210249A736C8	Open
xc7s50_0 (2)	Not programmed
XADC (System Monitor)	
s25fl128l-spi-x1_x2_x4	
xilinx_tcf/Digilent/210308A46	Closed

Configuration Memory Device Properties

s25fl128l-spi-x1_x2_x4

Name: s25fl128l-spi-x1_x2_x4

Memory Part: s25fl128l-spi-x1_x2_x4

Memory type: spi

Memory density: 128

Programming file:

Program Configuration Memory Device

Select a configuration file and set programming options.

Memory Device: s25fl128l-spi-x1_x2_x4

Configuration file: _vmm3a/Spartan7_vmm3a_hybrid_44p4.mcs

PRM file:

State of non-config mem I/O pins: Pull-none

Program Operations

Address Range: Configuration File Only

Erase

Blank Check

Program

Verify

Verify Checksum

SVF Options

Create SVF Only (no program operations)

SVF File:

OK Cancel Apply

Step 10: Wait until programming is finished.

The screenshot shows the Vivado 2019.1 interface. The top menu bar includes File, Edit, Tools, Reports, Window, Layout, View, and Help. Below the menu is a toolbar with icons for navigation and settings. The main window title is "HARDWARE MANAGER - localhost/xilinx_tcf/Digilent/210249A736C8". A green banner at the top of the hardware manager area contains the message: "There are no debug cores. Program device Refresh device".

The Hardware Manager window is divided into two panes. The left pane, titled "Hardware", contains a tree view of the hardware components. The right pane is currently empty.

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC	Closed
xilinx_tcf/Digilent/210249A736C8	Open
xc7s50_0 (2)	Programmed
XADC (System Monitor)	
s25fl128l-spi-x1_x2_x4	
xilinx_tcf/Digilent/210308A46	Closed

The Properties pane at the bottom left is empty and contains the text "Select an object to see properties".

A "Program Configuration Memory Device" dialog box is open in the foreground. It displays the progress of the programming operation: "Performing program operation - Step 2 of 2...". A progress bar shows 6% completion. The dialog has "Background" and "Cancel" buttons.

Step 11: Congrats!

The screenshot shows the Vivado 2019.1 interface. The top menu bar includes File, Edit, Tools, Reports, Window, Layout, View, and Help. Below the menu is a toolbar with icons for various actions. The main window title is "Vivado 2019.1".

The Hardware Manager window is open, displaying a list of hardware components. The status bar at the top of the Hardware Manager indicates "There are no debug cores. Program device Refresh device".

Name	Status
localhost (3)	Connected
xilinx_tcf/Digilent/210299ABC	Closed
xilinx_tcf/Digilent/210249A73	Open
xc7s50_0 (2)	Programmed
XADC (System Monitor)	
s25fl128l-spi-x1_x2_x4	
xilinx_tcf/Digilent/210308A46	Closed

The Properties window is empty, showing the text "Select an object to see properties".

A "Program Flash" dialog box is displayed in the foreground, indicating that the flash programming was successful. The message reads: "Flash programming completed successfully." with an "OK" button.