Digilent Plug-in for Xilinx 13.x Tools User Manual

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Overview

The Digilent Plug-in for Xilinx tools allows Xilinx software tools to directly use the Digilent USB-JTAG FPGA configuration circuitry. For 13.x, Xilinx Impact, Chipscope Pro, EDK Xilinx Microprocessor Debugger (XMD) command line mode, and EDK Software Development Kit (SDK) are currently supported by the Plug-in. Refer to http://www.xilinx.com/ for more information about these Xilinx design tools.

Software Versions Tested:
Xilinx ISE Design Suite Version 13.x only (Refer to http://www.digilentinc.com/ for versions of the plugin for later Xilinx ISE versions)
Digilent Adept System 2.6 (or Digilent Runtime 2.5 for Linux) or greater
Supported Operating Systems:

- Microsoft Windows 32-bit and 64-bit Operating Systems
- Linux: Red Hat and CentOS 4.8, 5.4 (x86/x64), and SUSE 11.2 (x86/x64)

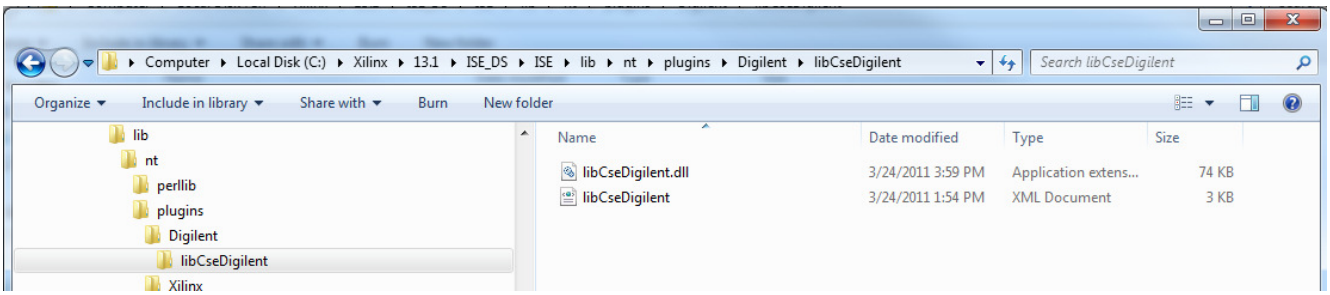
Windows Installation

To begin, ensure that the Xilinx ISE Suite (13.x only) and Digilent Adept System 2.6 (or greater) is installed on the host computer. Also ensure that the Microsoft Visual C++ 2008 Service Pack 1 Redistributable Package ATL Security Update is installed on the host computer. The Visual C++ Package is available for download at the following website:

http://www.microsoft.com/downloads/en/details.aspx?FamilyID=2051A0C1-C9B5-4B0A-A8F5-770A549FD78C

The Plug-in files “libCseDigilent.dll” and “libCseDigilent.xml” must be copied into the ISE Design Suite installation.

For the ISE Design Suite, the typical location is
C:\Xilinx\13.1\ISE_DS\ISE\lib\nt\plugins\Digilent\libCseDigilent
Note: For 64-bit Windows, use **nt64** in place of **nt**



For the ISE Lab Tools, the typical location is
C:\Xilinx\13.1\LabTools\LabTools\lib\nt\plugins\Digilent\libCseDigilent
Note: For 64-bit Windows, use **nt64** in place of **nt**

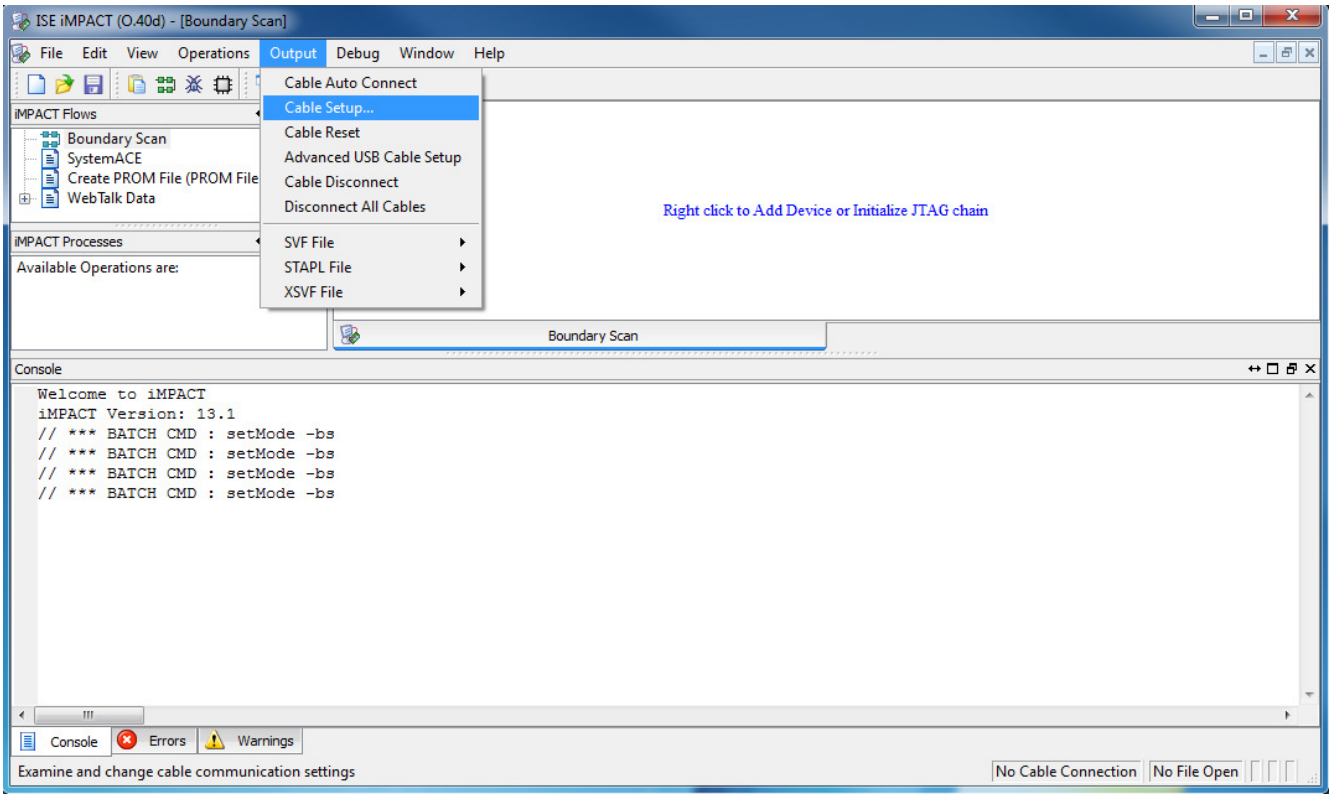
Linux Installation

To begin, ensure that the Xilinx ISE Suite (13.x only) and Digilent Adept Runtime 2.5 (or greater) is installed on the host computer. The Plug-in files "libCseDigilent.so" and "libCseDigilent.xml" must be copied into the ISE Design Suite installation.

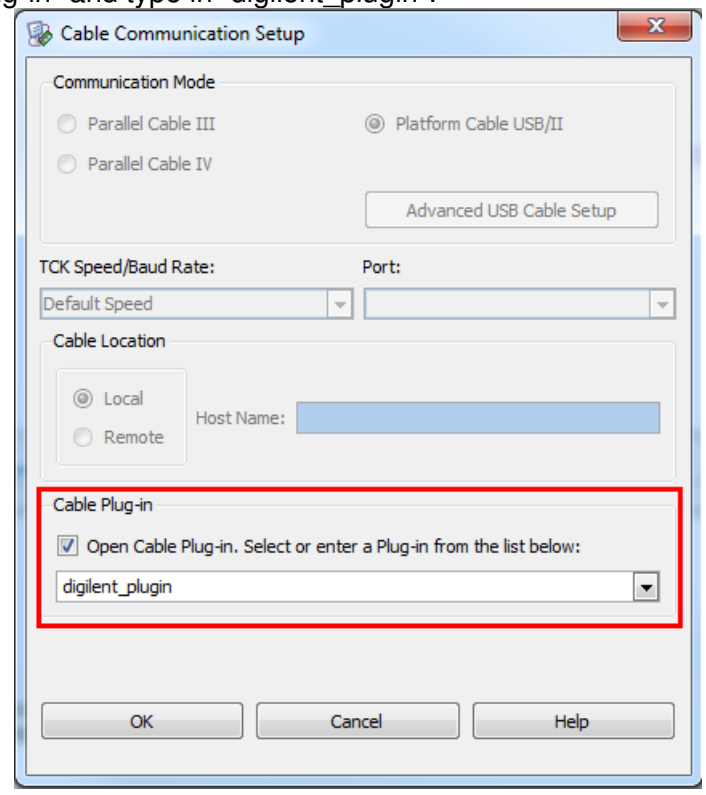
For the ISE Design Suite, the typical location is **$XILINX/lib/lin/plugins/Digilent/libCseDigilent**
Note: For 64-bit Linux, use **lin64** in place of **lin**

Impact Setup

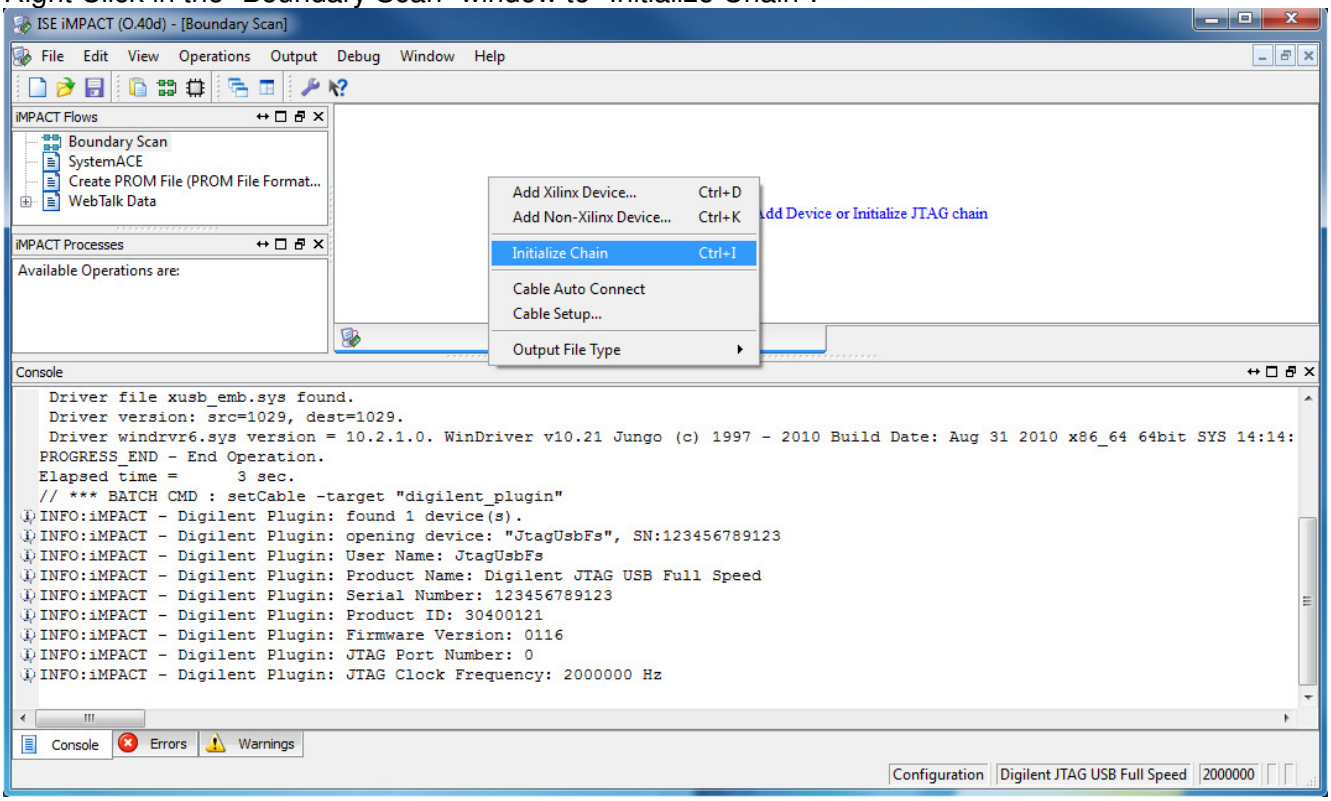
Xilinx Impact is used to download FPGA bitstreams to FPGA boards. The following steps show how to use Impact with the Plug-in. First, launch Impact, double click on "Boundary Scan", and select the "Cable Setup…" menu item from the "Output" menu.



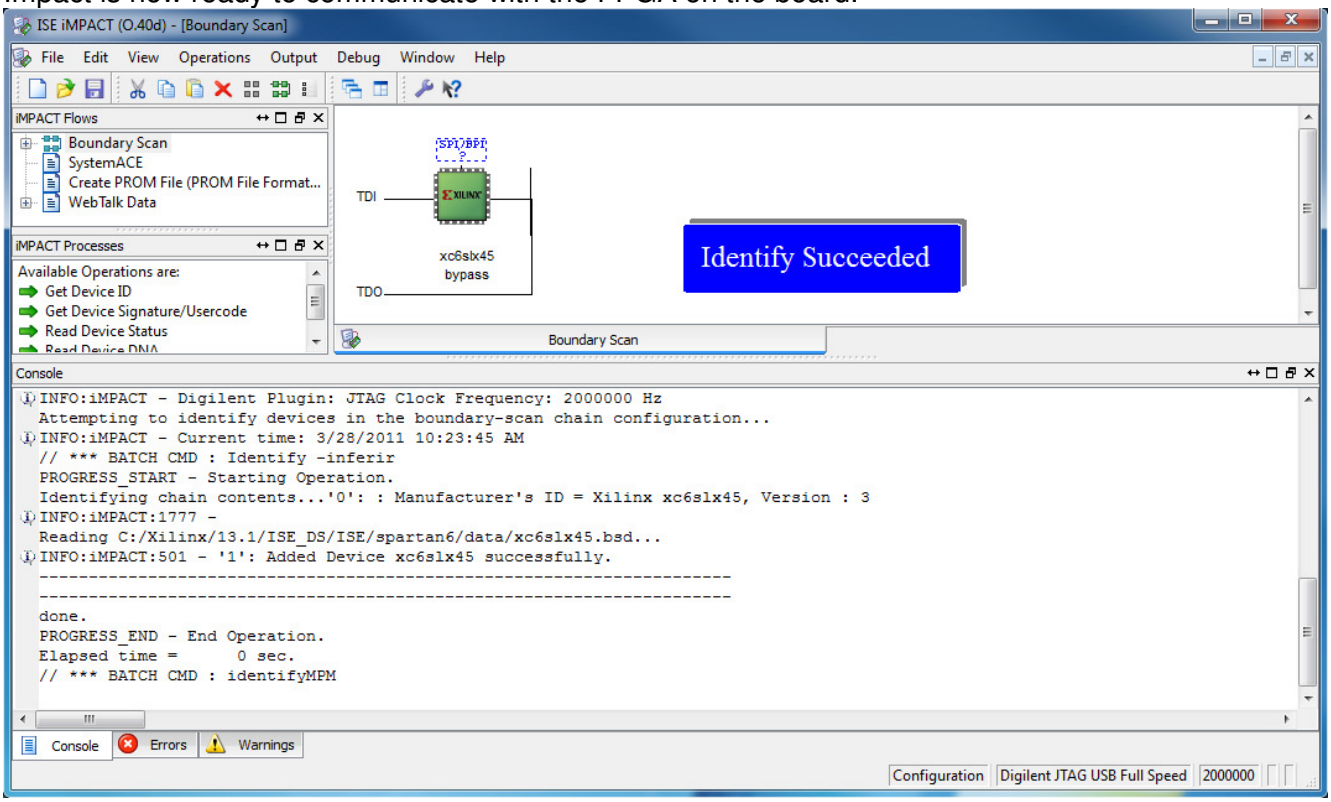
Select "Open Cable Plug-in" and type in "digilent_plugin":



Right Click in the "Boundary Scan" window to "Initialize Chain":

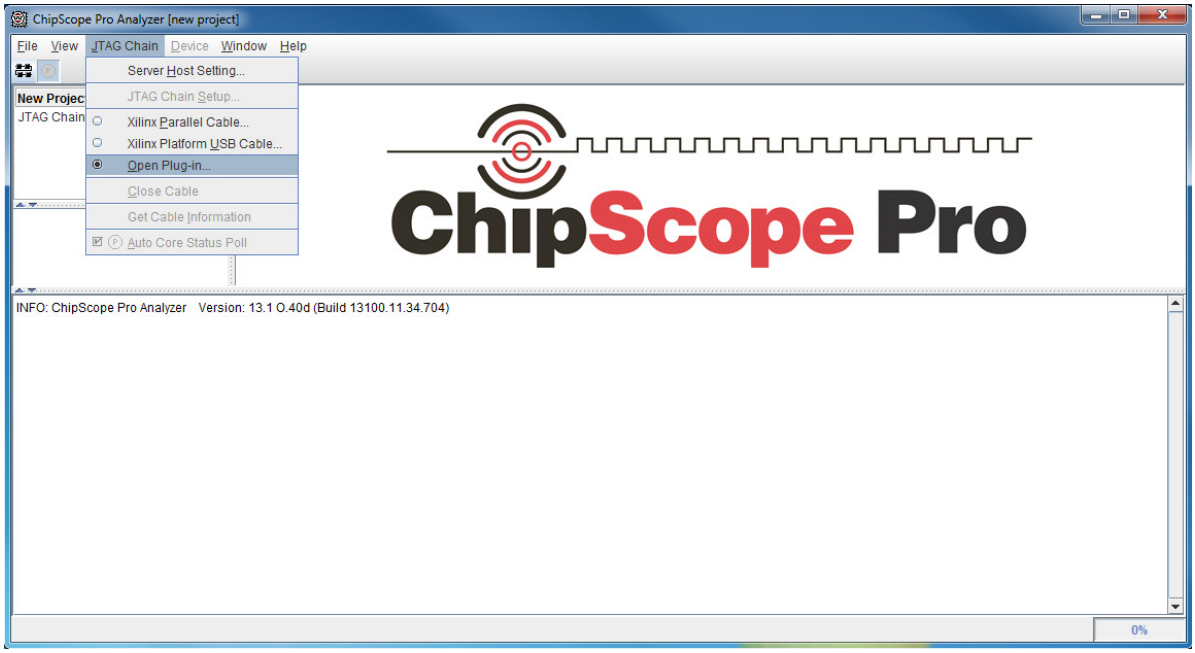


Impact is now ready to communicate with the FPGA on the board:

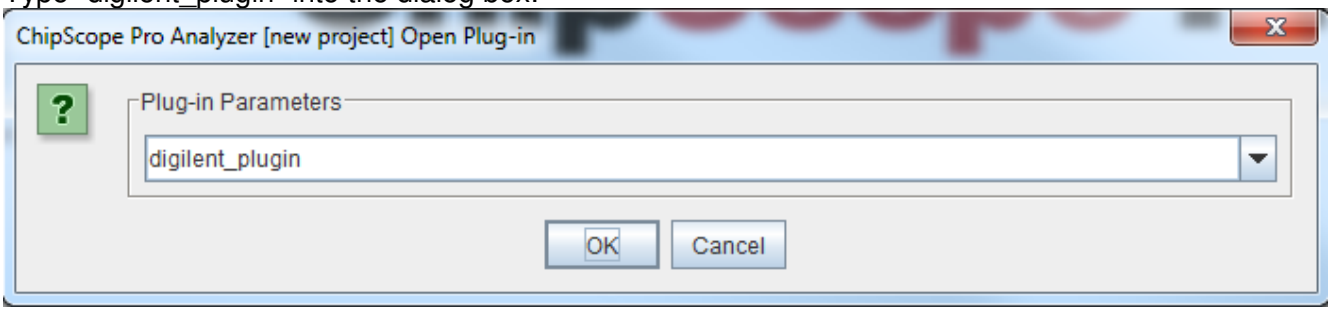


ChipScope Pro Analyzer Setup

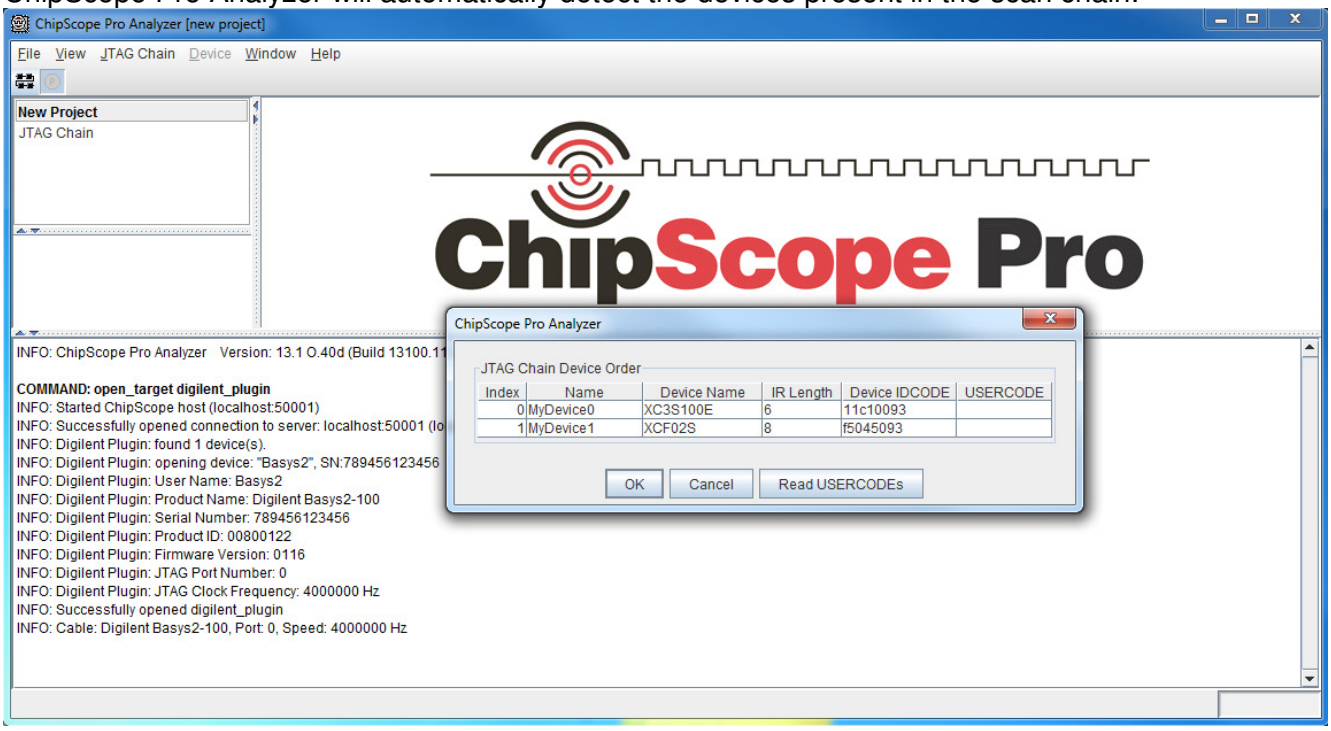
Launch ChipScope Pro Analyzer and select the "Open Plug-in…" menu item from the "JTAG Chain" menu:



Type "digilent_plugin" into the dialog box:

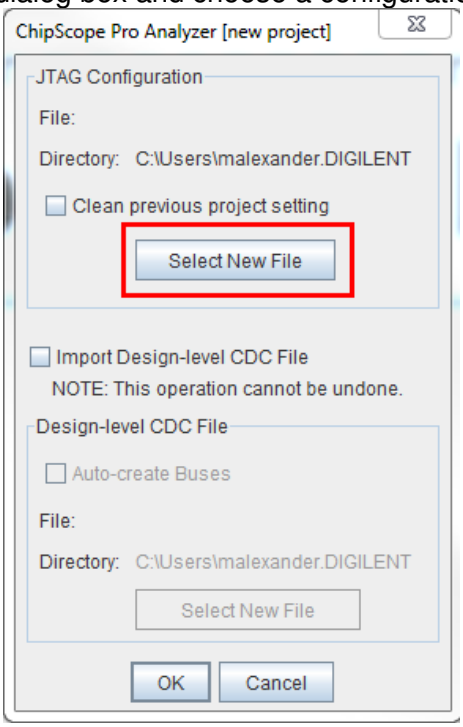


ChipScope Pro Analyzer will automatically detect the devices present in the scan chain:

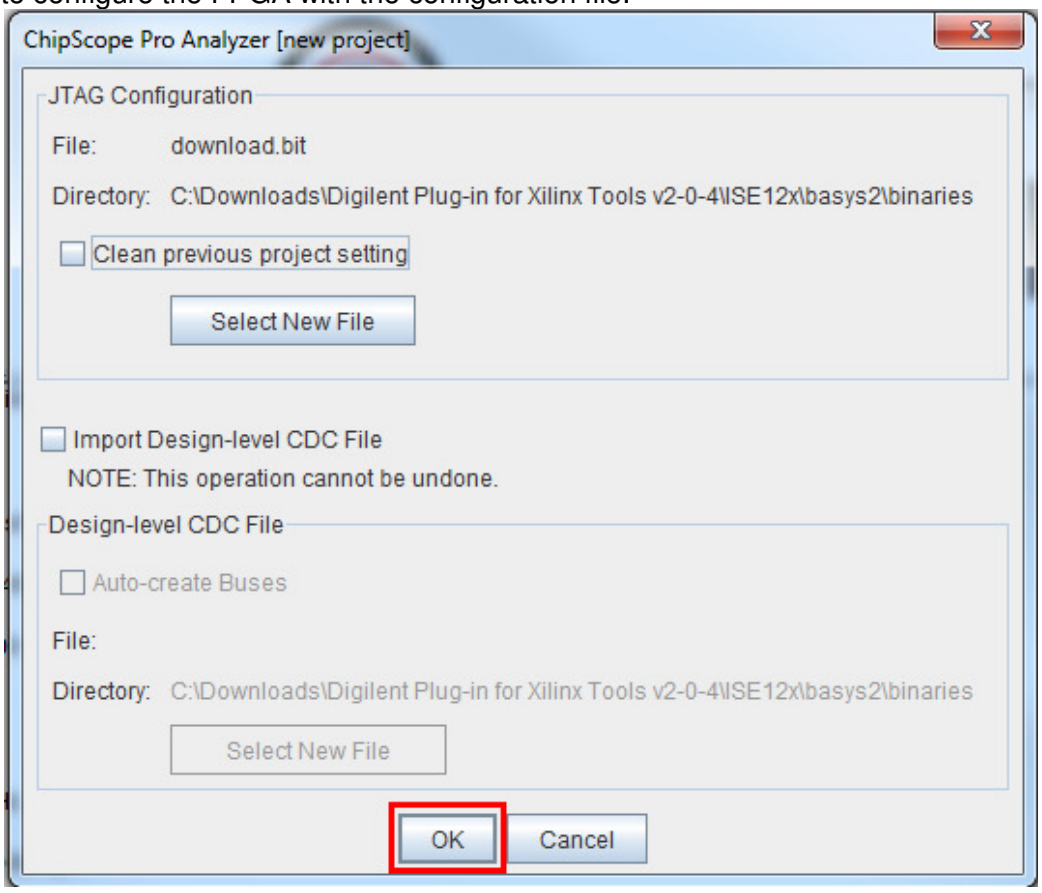


To configure a device right click on it and select "Configure…":

Click on "Select New File" in the dialog box and choose a configuration file:



Click "OK" to configure the FPGA with the configuration file:



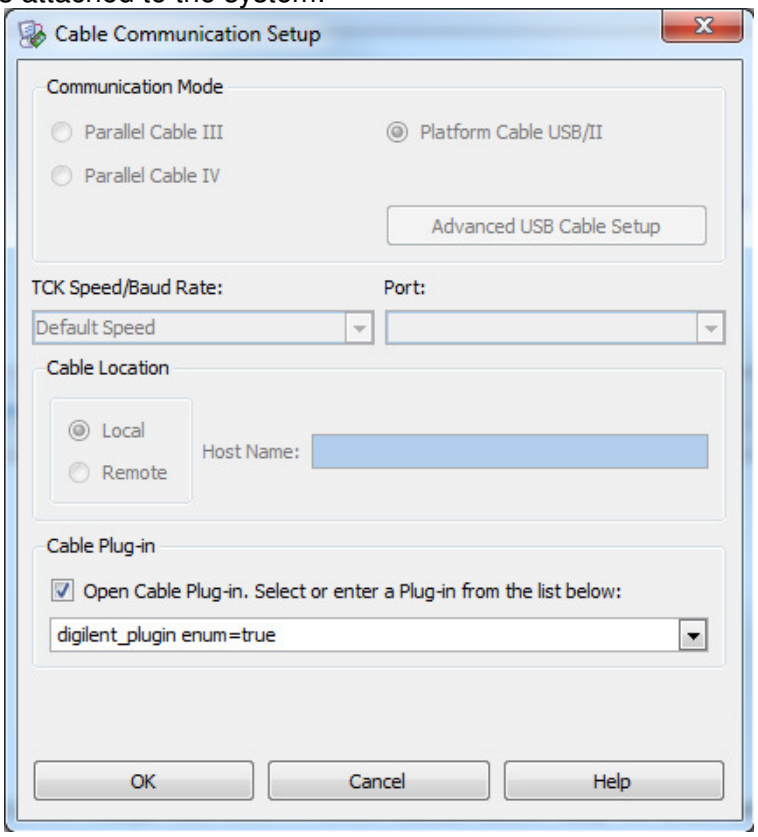
Selecting which Digilent device is opened by the Plug-In

By default the Plug-in performs device discovery (enumeration) and opens the first Digilent device found. A specific device may be opened by specifying its user name or serial number as an argument to the Plug-in. To open a device by user name add **"device=user_name"** to the command used to open the Plug-in, replacing "user_name" with the user name of the device that you wish to open. To open a device by serial number add **"device=SN:serial_number"** to the command used to open the Plug-in, replacing "serial_number" with the serial number of the device that you wish to open.

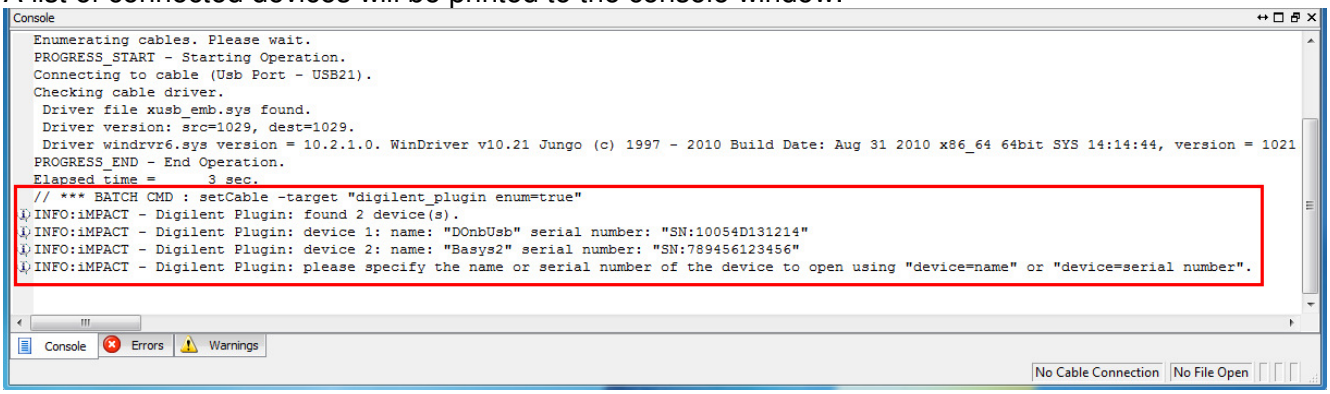
Consider a system that has a device attached whose user name is "DOnbUsb". To open this device use the string "**digilent_plugin device=DOnbUsb"** when specifying the Plug-in parameters in the Xilinx tool of choice. Consider another system that has a device attached whose serial number is "789456123456". To open this device use the string **"digilent_plugin device=SN:789456123456"** when specifying Plug-in parameters.

Before a specific device can be opened it is necessary to determine which devices are attached to the system. Specifying **"digilent_plugin enum=true"** for the Plug-in parameters will cause the Plug-in to perform device discovery and output a list of attached devices to the console window. The name (user name) and serial number of each attached device is displayed. Either one of these may be used to specify which device is opened by the Plug-in.

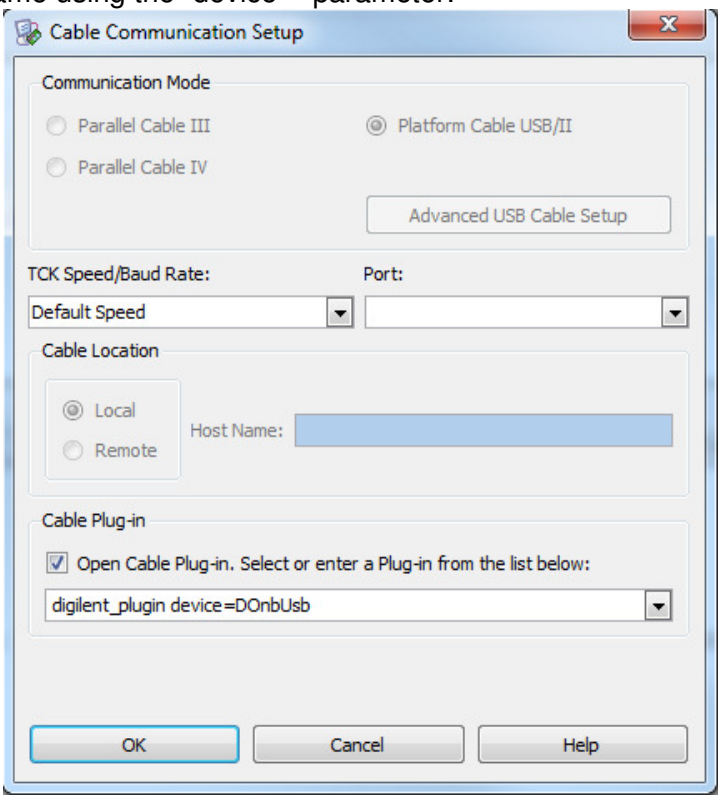
List all Digilent devices attached to the system:

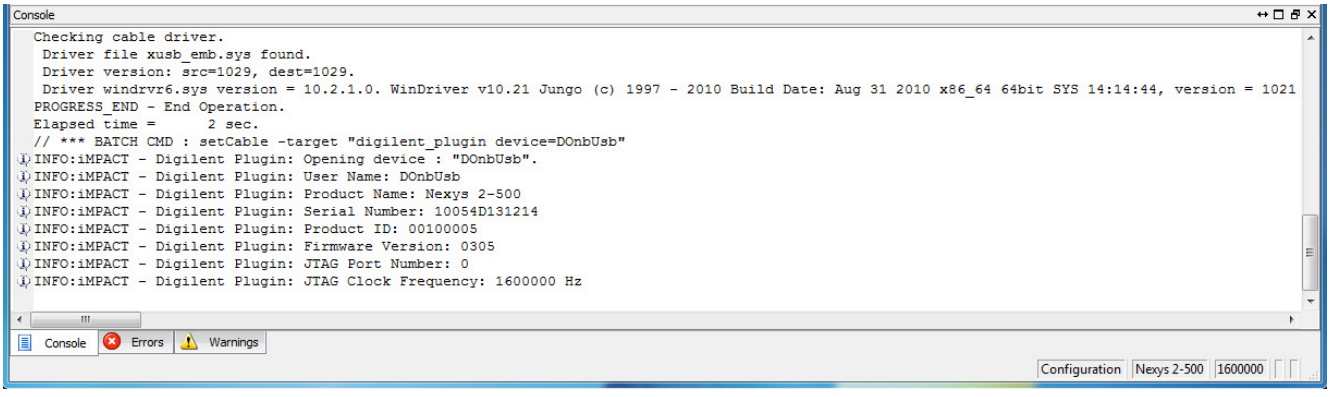


A list of connected devices will be printed to the console window:

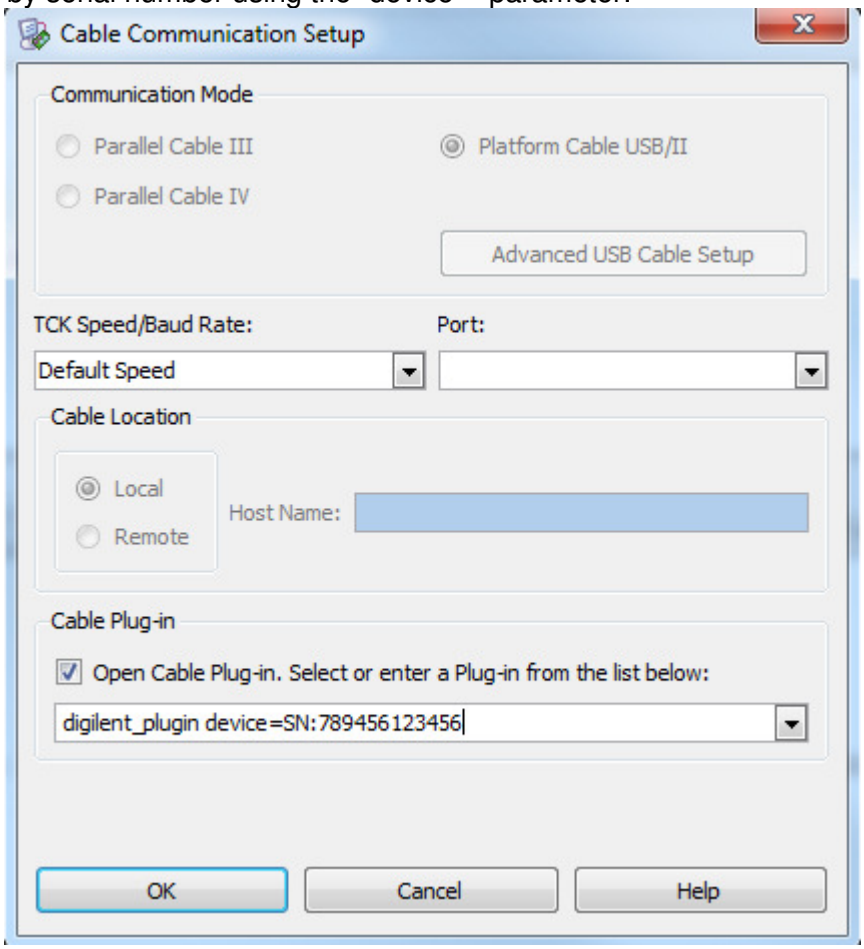


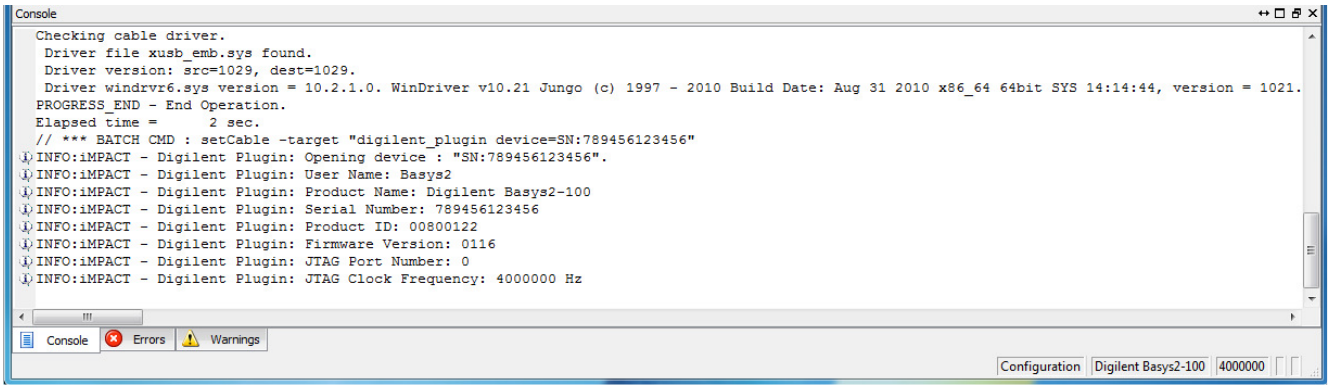
Opening a device by name using the "device=" parameter:





Opening a device by serial number using the "device=" parameter:

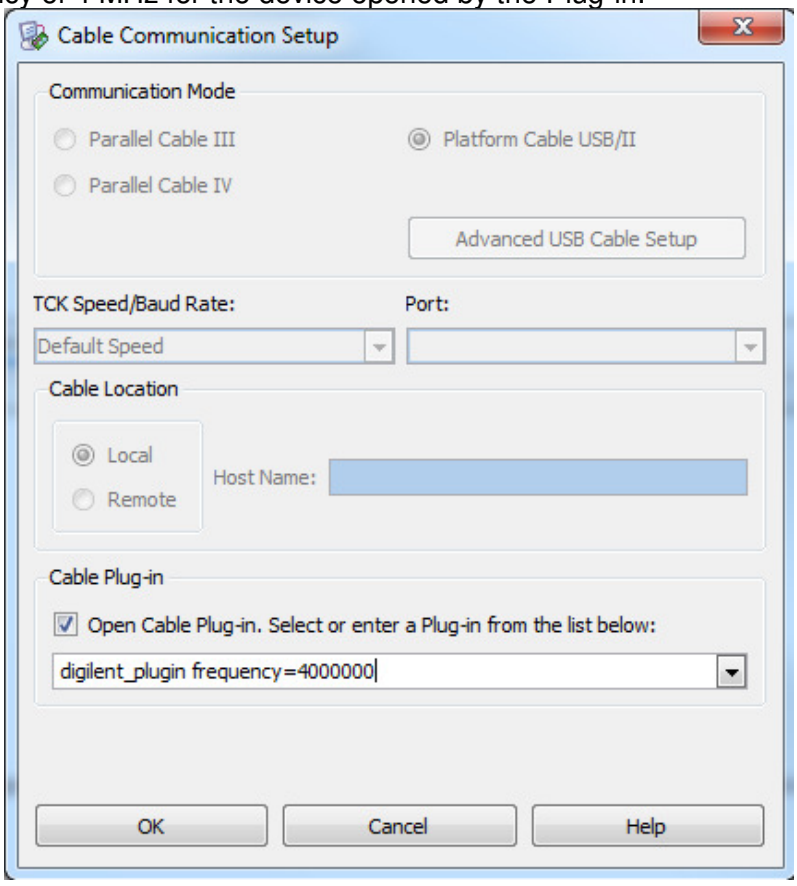




Specifying the JTAG clock (TCK) frequency used by the Plug-in

Some Digilent devices support multiple clock frequencies. The clock frequency used by the device may be specified by adding the argument **"frequency=requested_freq"** to the command used to open the Plug-in, replacing "requested_freq" with the requested operating frequency in hertz. If the device supports the requested frequency then that frequency will be used. If the device does not support the requested frequency then the next closest frequency that is less than the specified frequency will be used. If the device doesn't support multiple frequencies or if no frequency is specified then the default frequency is used. Please note that the default frequency varies with device.

Specifying a frequency of 4 MHz for the device opened by the Plug-in:




```
// *** BATCH CMD : setCable -target "digilent_plugin frequency=4000000"
INFO:iMPACT - Digilent Plugin: found 1 device(s).
INFO:iMPACT - Digilent Plugin: opening device: "JtagUsbFs", SN:123456789123
INFO:iMPACT - Digilent Plugin: User Name: JtagUsbFs
INFO:iMPACT - Digilent Plugin: Product Name: Digilent JTAG USB Full Speed
INFO:iMPACT - Digilent Plugin: Serial Number: 123456789123
INFO:iMPACT - Digilent Plugin: Product ID: 30400121
INFO:iMPACT - Digilent Plugin: Firmware Version: 0116
INFO:iMPACT - Digilent Plugin: JTAG Port Number: 0
INFO:iMPACT - Digilent Plugin: JTAG Clock Frequency: 4000000 Hz
```

Console | Errors | Warnings

Specifying a frequency of 3 MHz for a specific device to be opened by the Plug-in: