

Digilent Plug-in for Xilinx 14.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 14.x, Xilinx Impact, ChipScope Pro, EDK Xilinx Microprocessor Debugger (XMD) command line mode, and EDK Xilinx 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 14.x only (Refer to <http://www.digilentinc.com/> for versions of the plugin for later Xilinx ISE versions)

Digilent Adept System 2.9 (or Digilent Adept Runtime 2.9 for Linux) or greater

Supported Operating Systems:

- Microsoft Windows 32-bit and 64-bit Operating Systems
- Linux: Red Hat and CentOS 4, 5, 6 (x86/x64), and SUSE 11 (x86/x64)

Plug-In Installation

To begin, ensure that Xilinx ISE Suite (14.x only) and Digilent Adept System 2.9 (or greater) for Windows, or Digilent Adept Runtime 2.9 (or greater) for Linux, is installed on the host computer. For Windows Systems also ensure that Microsoft Visual C++ 2008 Service Pack 1 Redistributable Package MFC Security Update is installed on the host computer. The Visual C++ Package is available for download at the following website:

<http://www.microsoft.com/en-us/download/details.aspx?id=26368>

The plug-in files **libCseDigilent.dll** and **libCseDigilent.xml** must be copied to a location that is searched by the ISE Suite. Beginning with version 13.1, ISE searches for Plug-ins in the following locations:

1. The **.cse** directory under the current user's directory. On Windows systems the path to the current user's directory is specified by the **%USERPROFILE%** environment variable. On Linux systems the **\$HOME** variable specifies the path to the current user's directory.
2. The **.cse** directory under the "all users" directory on Windows systems or the path specified by the **\$XIL_CSE_PLUGIN_DIR** environment variable on Linux systems. On Windows systems the path to the "all users" directory is specified by the **%ALLUSERSPROFILE%** environment variable. On Linux systems the **\$XIL_CSE_PLUGIN_DIR** environment variable specifies the path to the "all users" directory.
3. The ISE installation directory.

When ISE searches for a plug-in in the **.cse** directory it looks for compatible plug-ins in the following locations:

1. On Windows systems **.cse\<platform>\<ISE version>\plugins\<vendor>\<plugin>** is searched. On Linux systems **.cse/<platform>/<ISE version>/plugins/<vendor>/<plugin>/** is searched. If a plug-in is found under a directory whose platform, ISE version, vendor, and plug-in name match then it's loaded and the search is terminated. For example, if the 32-bit Windows version of iMPACT 14.3 attempts to open the Digilent Plug-in then ISE will search for **libCseDigilent.dll** and **libCseDigilent.xml** under the **.cse\nt\14.3\plugins\Digilent\libCseDigilent** directory. If this path exists and the files are found then the plug-in is loaded and the search is terminated.
2. On Windows systems **.cse\<platform>\<older ISE version of the same major release>\plugins\<vendor>\<plugin>** is searched. On Linux systems **.cse/<platform>/<older ISE version of the same major release>/plugins/<vendor>/<plugin>/** is searched. For example, if the 32-bit Windows version of iMPACT 14.3 attempts to open the Digilent Plug-in then ISE will search for **libCseDigilent.dll** and **libCseDigilent.xml** under the **.cse\nt\14.2\plugins\Digilent\libCseDigilent** directory. If the Plug-in is found it's loaded and the search terminates. If the Plug-in isn't found then ISE will search for **libCseDigilent.dll** and **libCseDigilent.xml** under the **.cse\nt\14.1\plugins\Digilent\libCseDigilent** directory. Once this search is performed the Plug-in is loaded or the search is terminated.

When ISE searches for a plug-in in the directory specified by the **XIL_CSE_PLUGIN_DIR** environment variable it looks for a compatible plug-in in the following locations:

1. **\$XIL_CSE_PLUGIN_DIR/<platform>/<ISE version>/plugins/<vendor>/<plugin>/** is searched. If a plug-in is found under a directory whose platform, ISE version, vendor, and plug-in name match then it's loaded and the search is terminated. For example, if the 32-bit Linux version of iMPACT 14.3 attempts to open the Digilent Plug-in then ISE will search for **libCseDigilent.so** and **libCseDigilent.xml** under the **\$XIL_CSE_PLUGIN_DIR/lin/14.3/plugins/Digilent/libCseDigilent/** directory. If this path exists and the files are found, then the plug-in is loaded and the search is terminated.
2. **\$XIL_CSE_PLUGIN_DIR/<platform>/<older ISE version of the same major release>/plugins/<vendor>/<plugin>/** is searched. For example, if the 32-bit Linux version of iMPACT 14.3 attempts to open the Digilent Plug-in then ISE will search for **libCseDigilent.so** and **libCseDigilent.xml** under the **\$XIL_CSE_PLUGIN_DIR/lin/14.2/plugins/Digilent/libCseDigilent/** directory. If the Plug-in is found it's loaded and the search terminates. If the Plug-in isn't found then ISE will search for **libCseDigilent.so** and **libCseDigilent.xml** under the **\$XIL_CSE_PLUGIN_DIR/lin/14.1/plugins/Digilent/libCseDigilent/** directory. Once this search is performed the Plug-in is loaded or the search is terminated.

Please note that if ISE finds a plug-in in more than one location the first compatible version found is loaded and the search is terminated.

Installing the Plug-in in the Current User's Directory

The Diligent Plug-in can be installed in the current user's directory on a Windows system by copying **libCseDiligent.dll** and **libCseDiligent.xml** to **%USERPROFILE%\cse\nt\14.1\plugins\Diligent\libCseDiligent**. For 64-bit Windows, use **nt64** in place of **nt**. The path to the current user's directory can be determined by executing "**echo %USERPROFILE%**" in a command prompt.

The Diligent Plug-in can be installed in the current user's directory on a Linux system by copying **libCseDiligent.so** and **libCseDiligent.xml** to **\$HOME/.cse/lin/14.1/plugins/Diligent/libCseDiligent/**. For 64-bit Linux, use **lin64** in place of **lin**. The path to the current user's directory can be determined by executing "**echo \$HOME**" in a terminal.

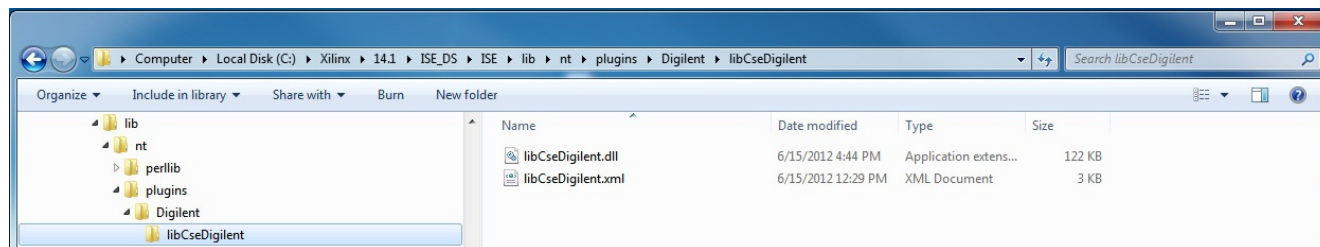
Installing the Plug-in in the "All Users" Directory

The Diligent Plug-in can be installed in the "all users" directory on a Windows system by copying **libCseDiligent.dll** and **libCseDiligent.xml** to **%ALLUSERSPROFILE%\cse\nt\14.1\plugins\Diligent\libCseDiligent**. For 64-bit Windows, use **nt64** in place of **nt**. The path to the "all users" directory can be determined by executing "**echo %ALLUSERSPROFILE%**" in a command prompt.

The Diligent Plug-in can be installed in the "all users" directory on a Linux system by copying **libCseDiligent.so** and **libCseDiligent.xml** to **\$XIL_CSE_PLUGIN_DIR/lin/14.1/plugins/Diligent/libCseDiligent/**. For 64-bit Linux, use **lin64** in place of **lin**. The path to the "all users" directory can be determined by executing "**echo \$XIL_CSE_PLUGIN_DIR**" in a terminal. Please note that a system administrator must add the **\$XIL_CSE_PLUGIN_DIR** variable to the profile of all users that are expected to use the plug-in.

Installing the Plug-in in the ISE Installation Directory

The Diligent Plug-in can be installed in the ISE installation directory by copying **libCseDiligent.dll** (**libCseDiligent.so** on Linux systems) and **libCseDiligent.xml** to the **plugins** directory. For the Windows version of ISE Design Suite, the typical location is **C:\Xilinx\14.1\ISE_DS\ISE\lib\nt\plugins\Diligent\libCseDiligent**. For 64-bit Windows, use **nt64** in place of **nt**.



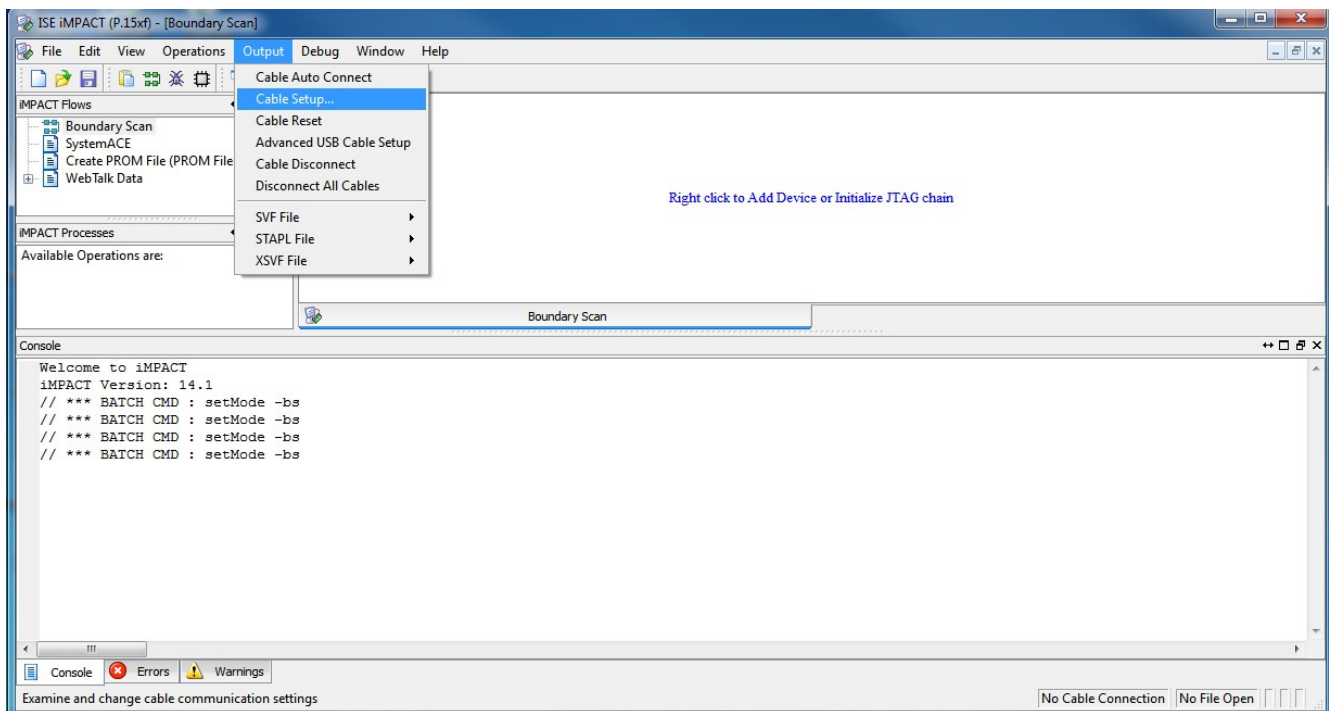
For the Windows version of ISE Lab Tools, the typical location is **C:\Xilinx\14.1\LabTools\LabTools\lib\nt\plugins\Diligent\libCseDiligent**. For 64-bit Windows, use **nt64** in place of **nt**.

For the Linux version of ISE Design Suite, the typical location is **\$XILINX/lib/lin/plugins/Diligent/libCseDiligent**. For 64-bit Linux, use **lin64** in place of **lin**.

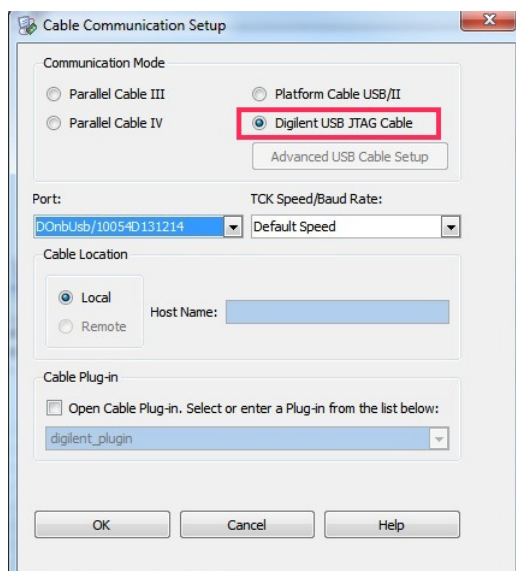
Impact Setup

Xilinx Impact is used to download bitstreams to FPGA boards. The following steps show how to use Impact with the Plug-in.

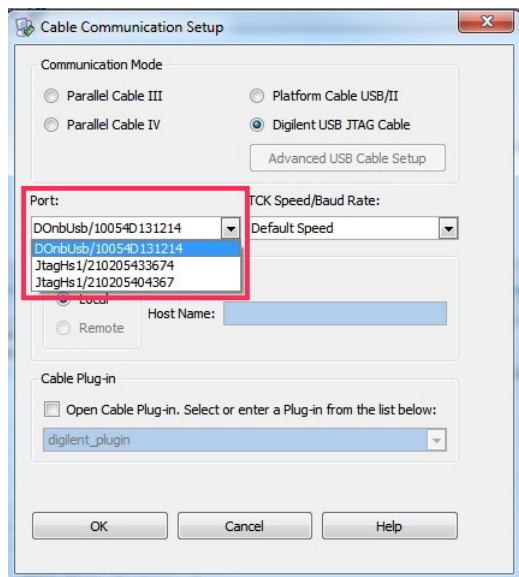
1. Launch Impact, double click on “Boundary Scan”, and select the “Cable Setup...” menu item from the “Output” menu.



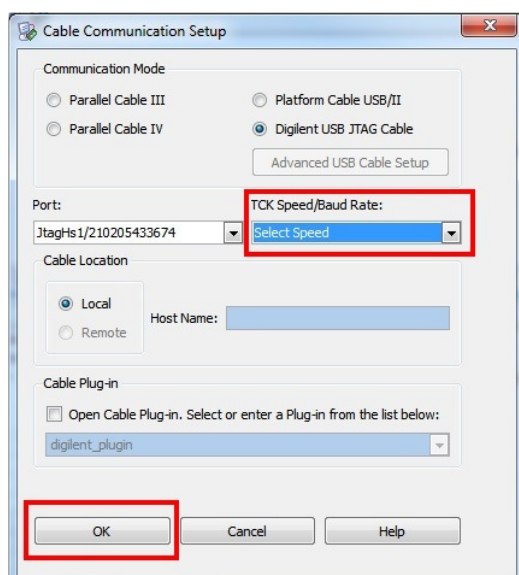
2. Select “Digilent USB JTAG Cable” for the “Communication Mode”.



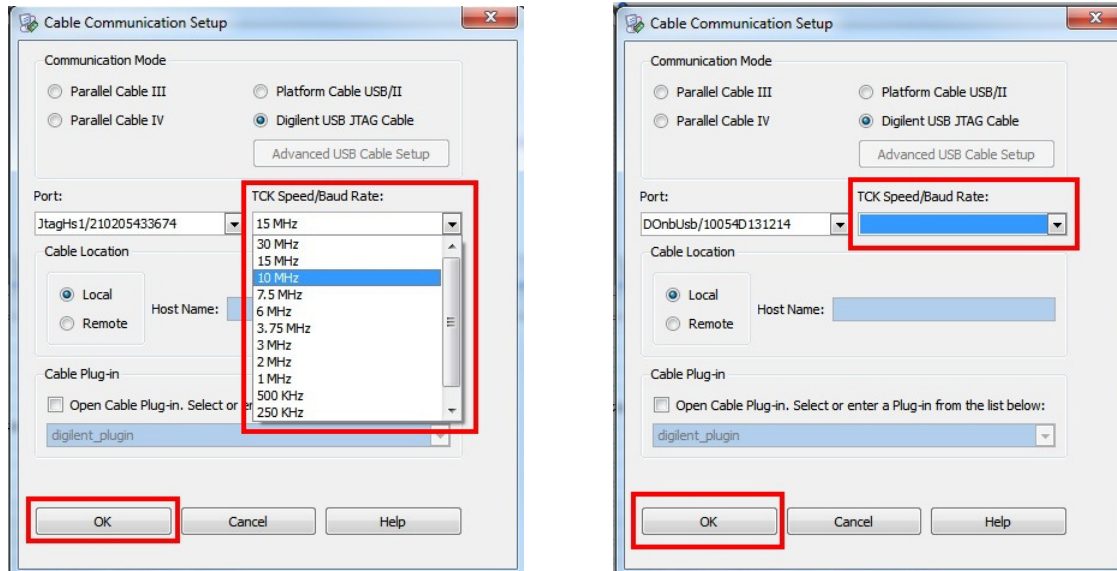
- The “Port:” drop-down list should now contain a list of available devices. Select a device to connect to. Some devices allow the TCK frequency to be adjusted. If you would like to adjust the device’s TCK frequency then proceed to step 4. Otherwise, click on “OK” and proceed to step 6.



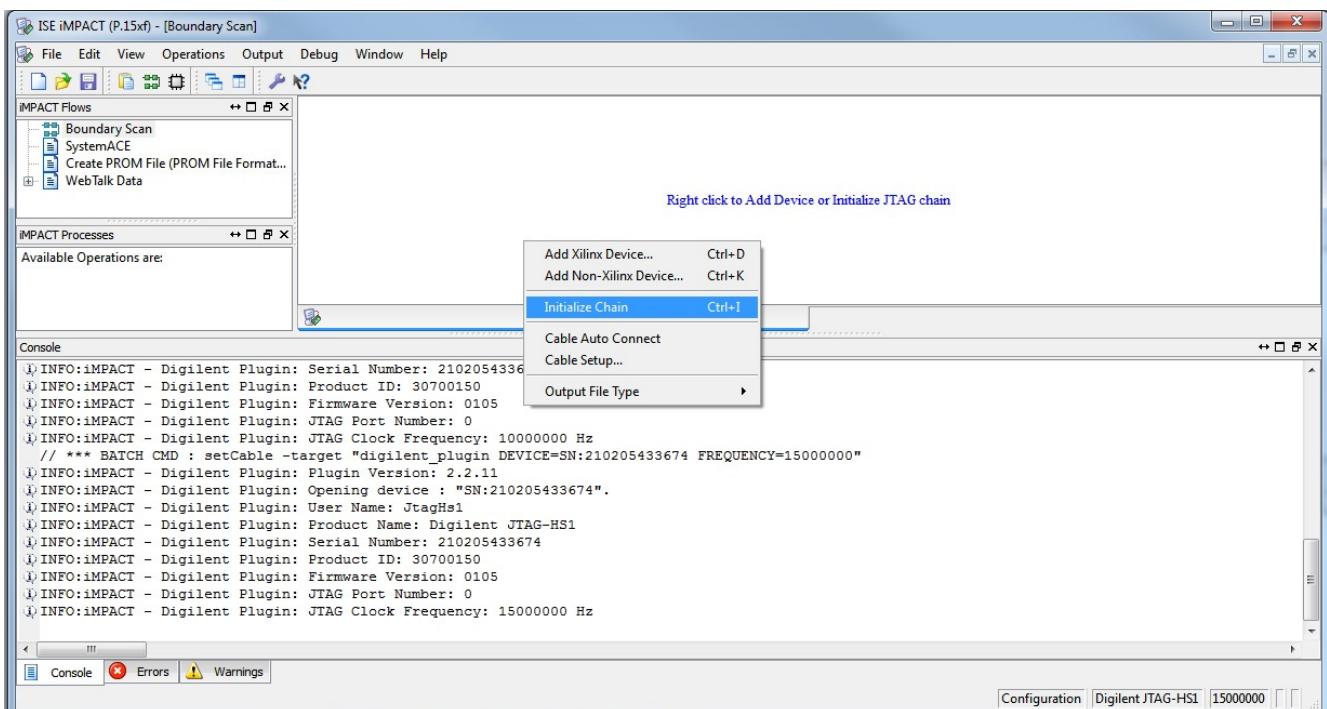
- The device’s TCK frequency can be selected using the “TCK Speed/Baud Rate:” drop-down list. This list initially contains two options: “Default Speed” and “Select Speed”. Choose the “Select Speed” option and click “OK”.



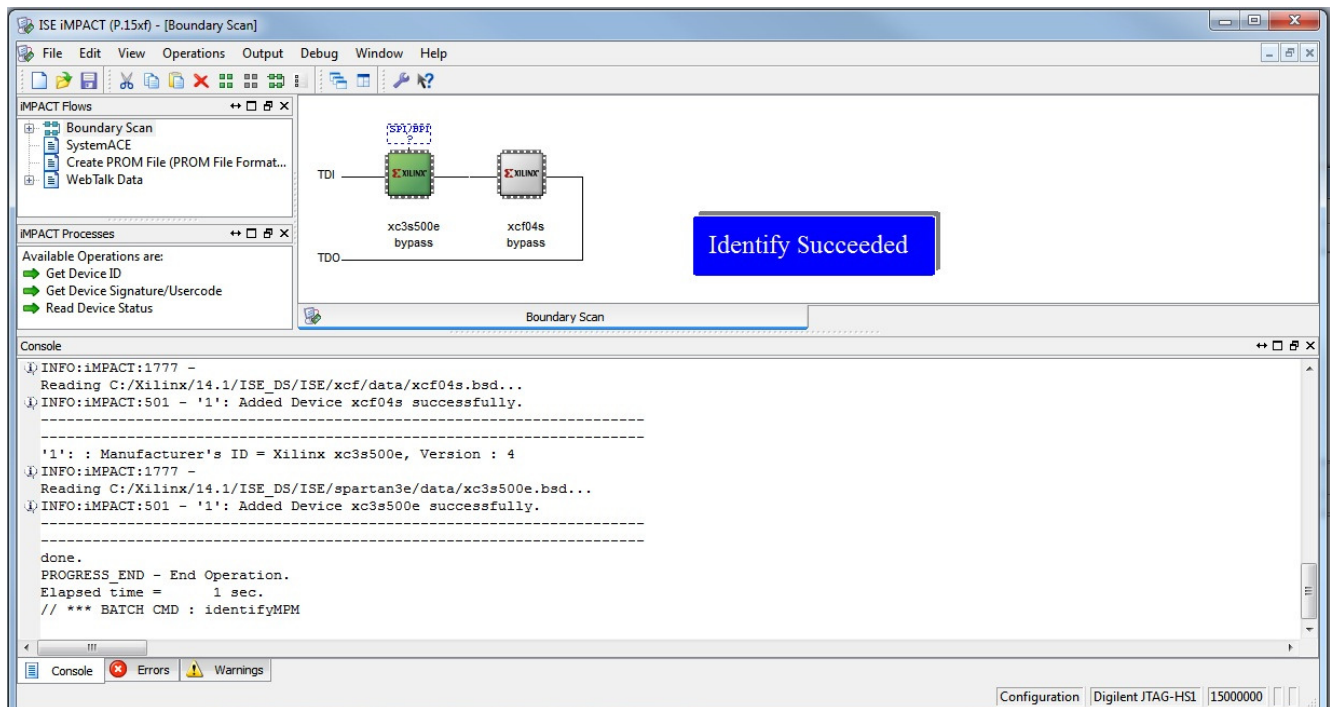
- If the device is capable of setting the TCK frequency then the “TCK Speed/Baud Rate:” drop-down list will be populated with a list of available frequencies. If the device isn’t capable of setting the TCK frequency then the “TCK Speed/Baud Rate:” drop-down list will become empty. Select the desired frequency and click “OK”.



- Right Click in the “Boundary Scan” window to and then click on “Initialize Chain”.



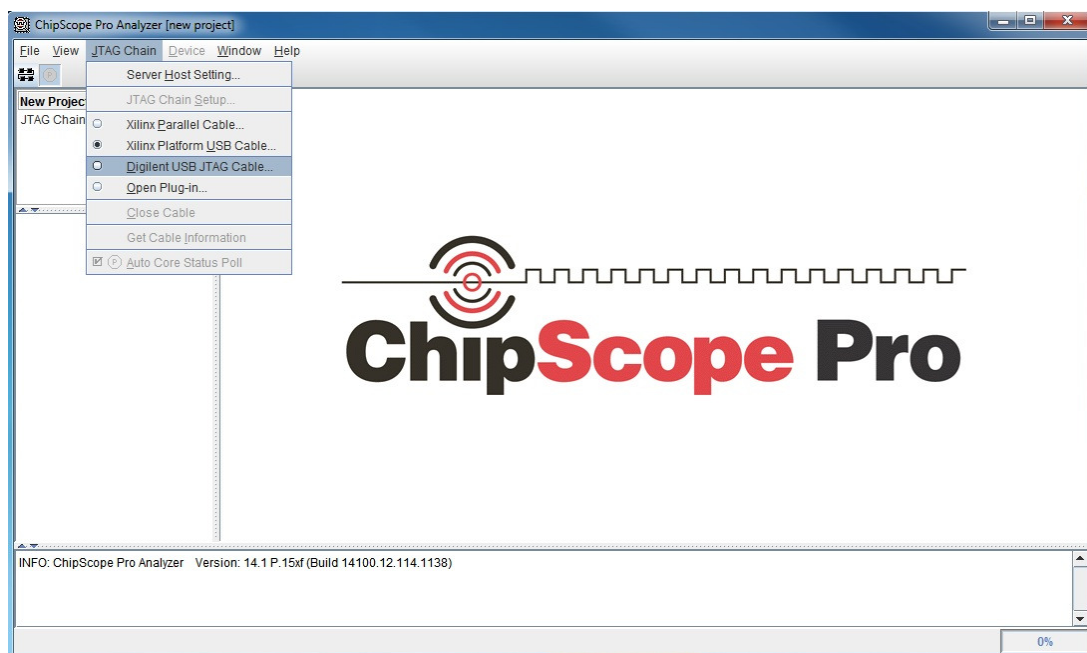
- Impact is now ready to communicate with the FPGA on the board.



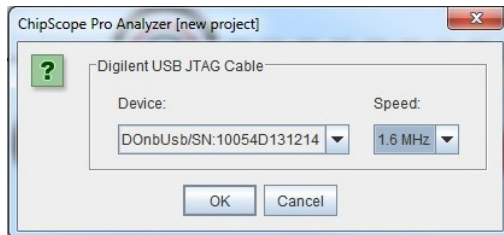
ChipScope Pro Analyzer Setup

The following steps show how to use the Plug-in with ChipScope Pro Analyzer.

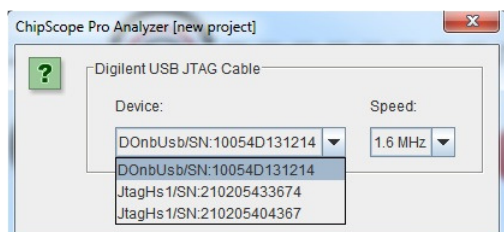
- Launch ChipScope Pro Analyzer and select the “Digilent USB JTAG Cable...” menu item from the “JTAG Chain” menu.



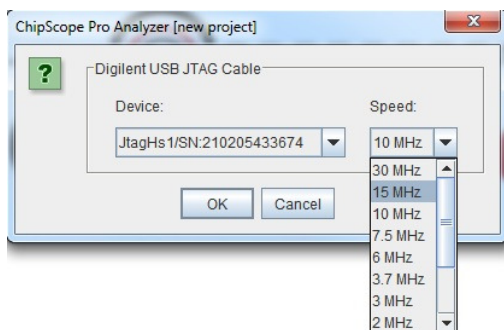
2. A dialog box containing two drop-down lists should appear. The first list, labeled "Device:", contains a list of all Digilent devices available to be opened. The second list, labeled "Speed:", lists the available TCK frequencies for the currently selected device.



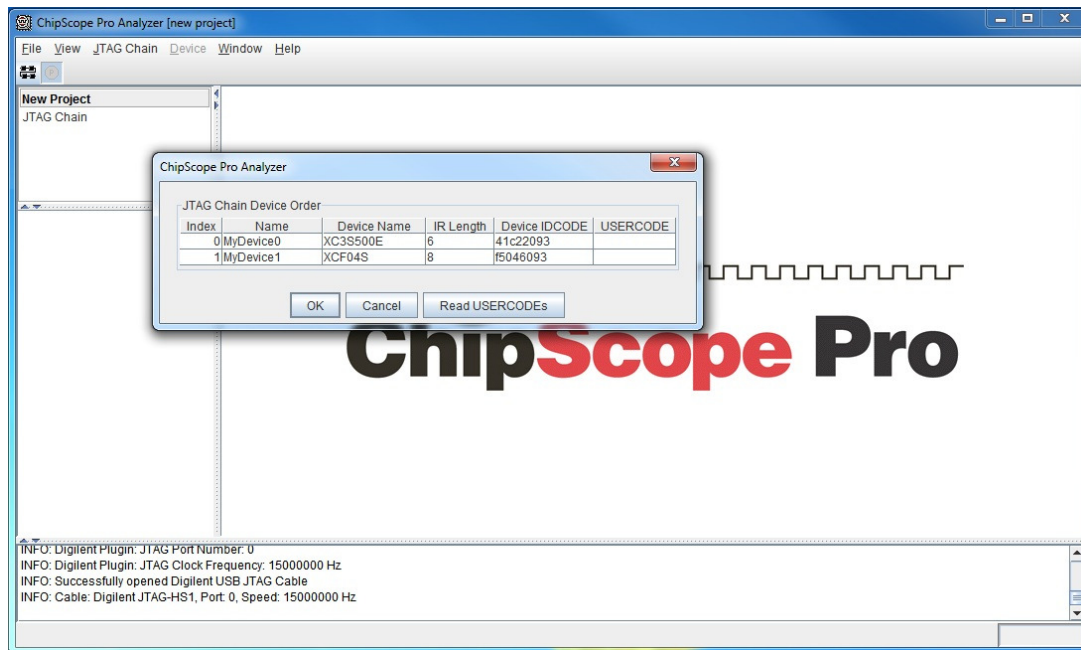
3. Select a device from the "Device:" drop-down list.



4. Select the desired TCK frequency from the "Speed:" drop down list and click the "OK" button. Please note that some devices only support a single TCK frequency.



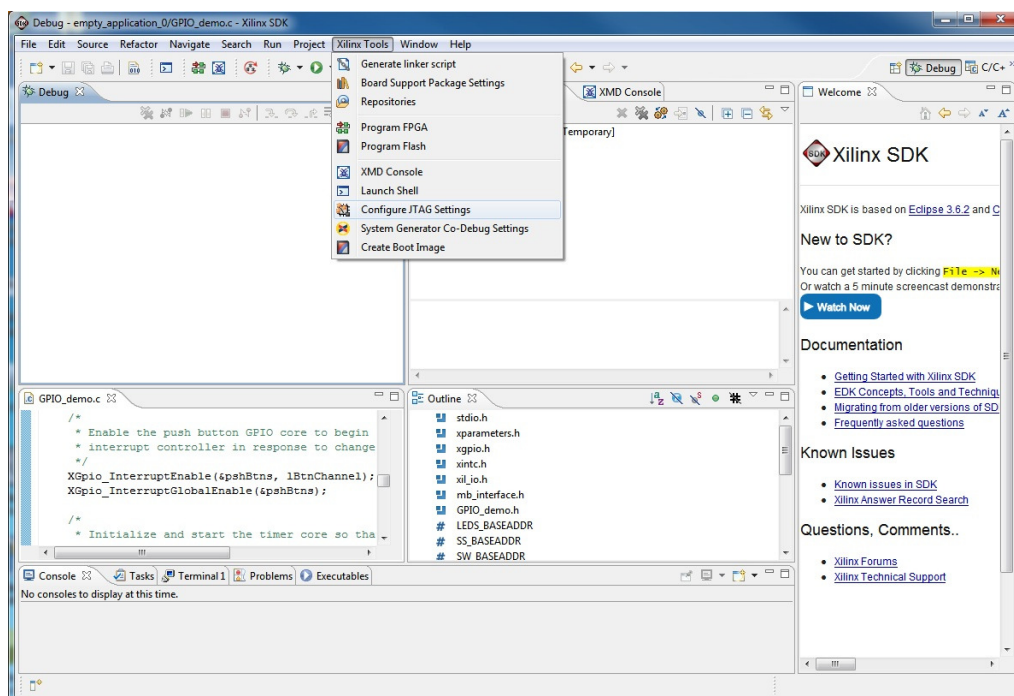
5. ChipScope Pro Analyzer is now ready to communicate with the devices on the board.



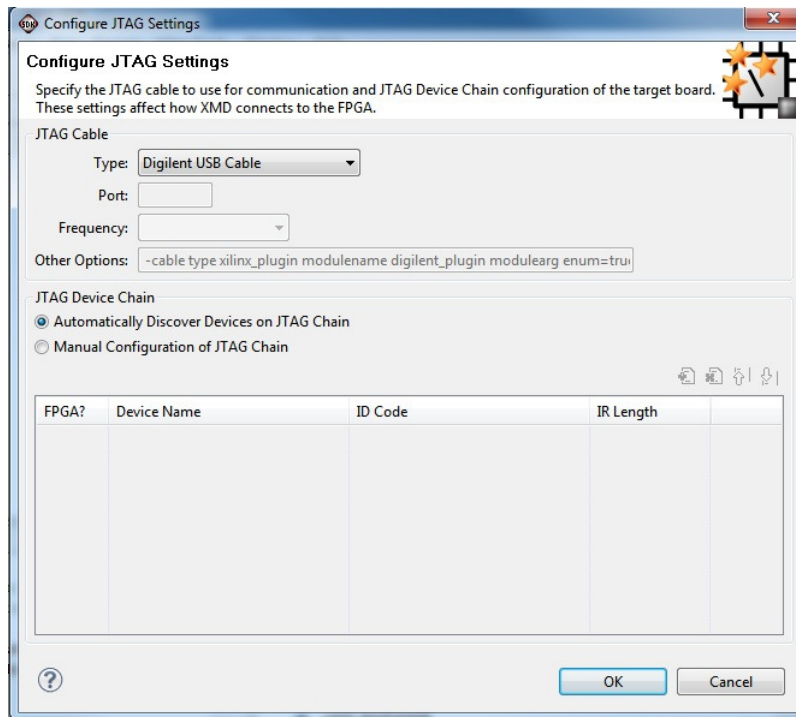
EDK Software Development Kit Setup

The following steps show how to use the Plug-in with Xilinx Software Development Kit.

1. Launch Xilinx Software Development Kit, open an existing workspace, and select the "Configure JTAG Settings" menu item from the "Xilinx Tools" menu.



2. A dialog box named “Configure JTAG Settings” should appear on the screen. In this dialog select “Digilent USB Cable” from the “Type:” drop-down list and press “OK”.



Xilinx SDK is now configured for the Digilent Plug-in. Programming and debugging operations will now use the first Digilent cable found by the Plug-in. Please note that version 14.1 of Xilinx SDK does not provide any means of selecting which Digilent device is used when more than one device is detected. This limitation should be addressed in a future release of Xilinx SDK.