Installation Tips for Coincidence Logic Unit

Version 1.1b

Empowered by

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Table of Contents

Revision History

Date	Document Version	FPGA Version	DLL Version	Remark
19.12.2013	1.0	2.17.3	2.17.1	Initial revision
09.01.2014	1.1	2.17.3	2.17.1	Added screenshots and firmware update guide
16.4.2015	1.1b			Updated JTAG option for new HW configuration with rear JTAG connector

This document provides tips on successfully installing the Coincidence Logic Unit with firmware version 2.17.3 under Timetag Explorer 2.17.1 on a PC running Windows 7 64-bit. Other versions of Windows will work but may have slightly different requirements. It does not matter if Timetag Explorer or the Coincidence Logic Unit driver is installed first.
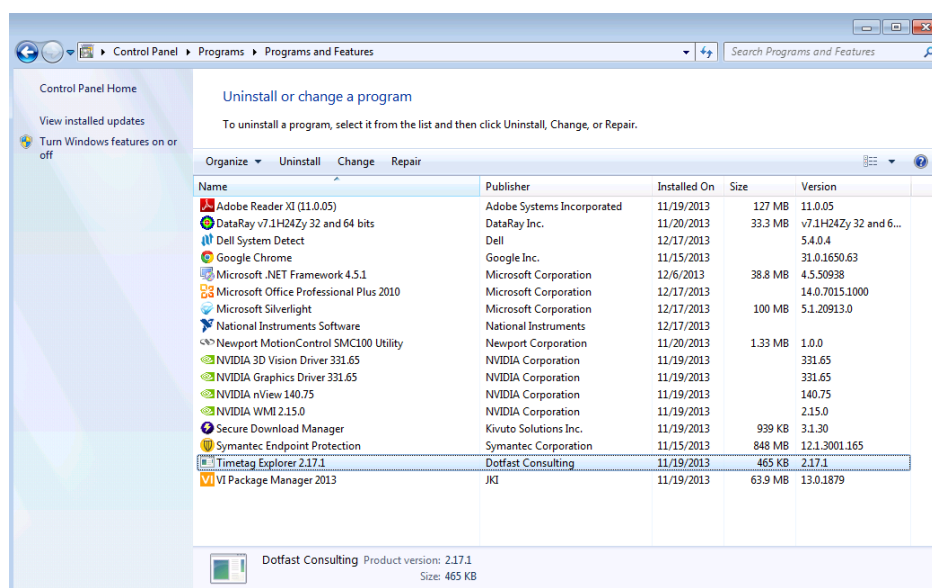
Installing Timetag Explorer

Update Windows and .NET

Use Windows Update to install the latest updates for your system, including the latest release of .NET, which may not be classified as "important" by Windows (current version .NET 4.5.1).
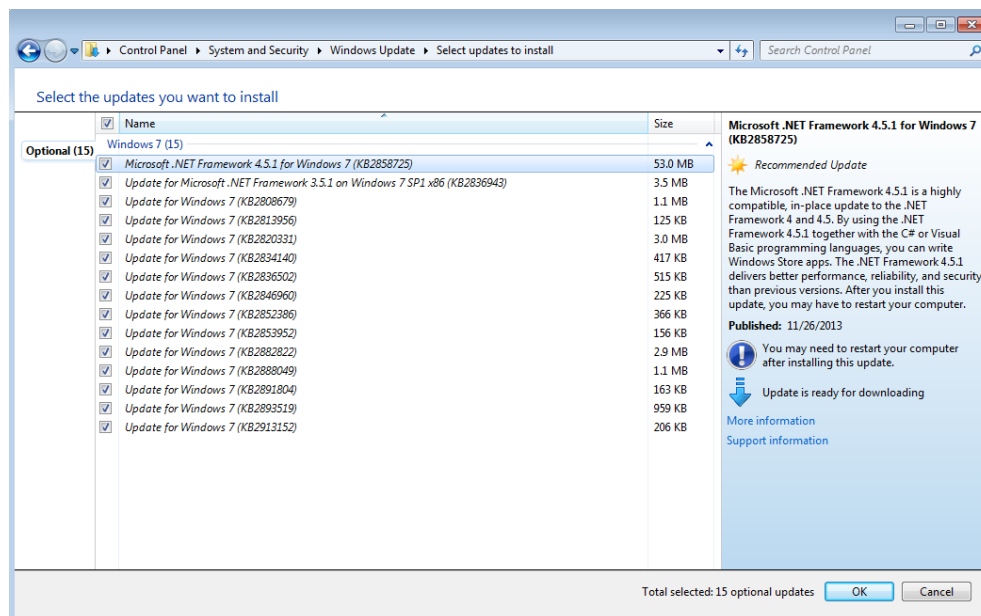

Remove previous versions of Timetag Explorer (Skip if no previous installations)

If there was a previous Coincidence Logic Unit installed on the system, use Windows' Uninstall a Program to remove all other versions of Timetag Explorer.

Remove old .dll files (Skip if no previous installations)

Uninstalling old versions of Timetag Explorer should remove the associated .dll files, but depending on the version removed there may be even older ones still in the General Assemblies Cache. Look in C:\Windows\assembly for UsbDll.dll, ttInterface.dll and Logic.dll and uninstall them. Check also the other Assemblies Caches by choosing Start>Run and entering C:\Windows\microsoft.net\Assembly. Look in each of the three folders therein (GAC_32, GAC_64, and GAC_MSIL) for the above dll files, and remove them.
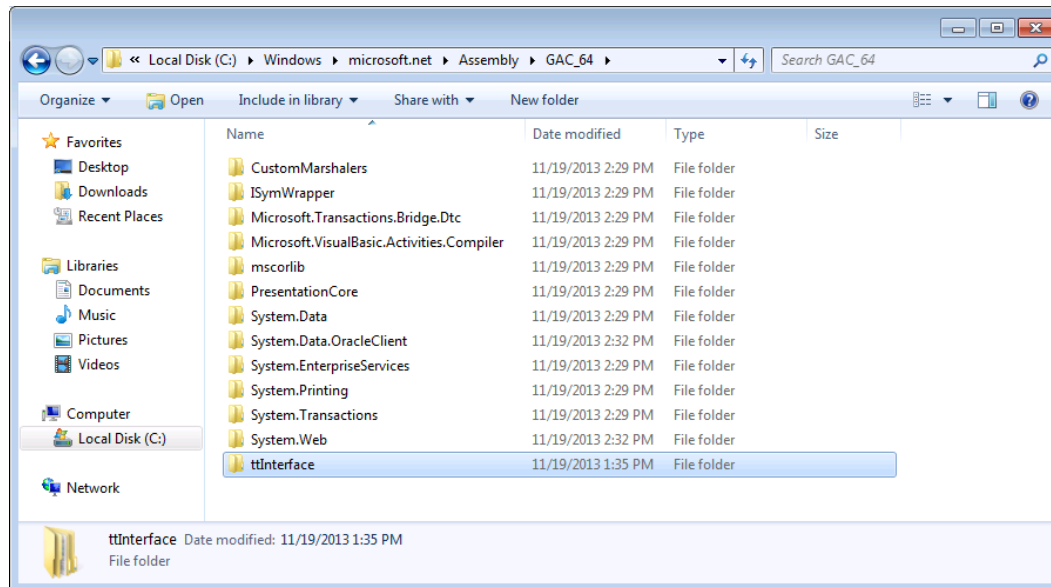
Install Timetag Explorer

After preparing the computer as above, run the 64-bit version of TimetagExplorerSetup_2_17_1.msi and follow the prompts. This will add ttInterface.dll to the GAC_64 folder, where it can be accessed by Timetag Explorer, LabView, Python, and other interfaces. The screenshots above show what will appear in those locations after a successful installation.
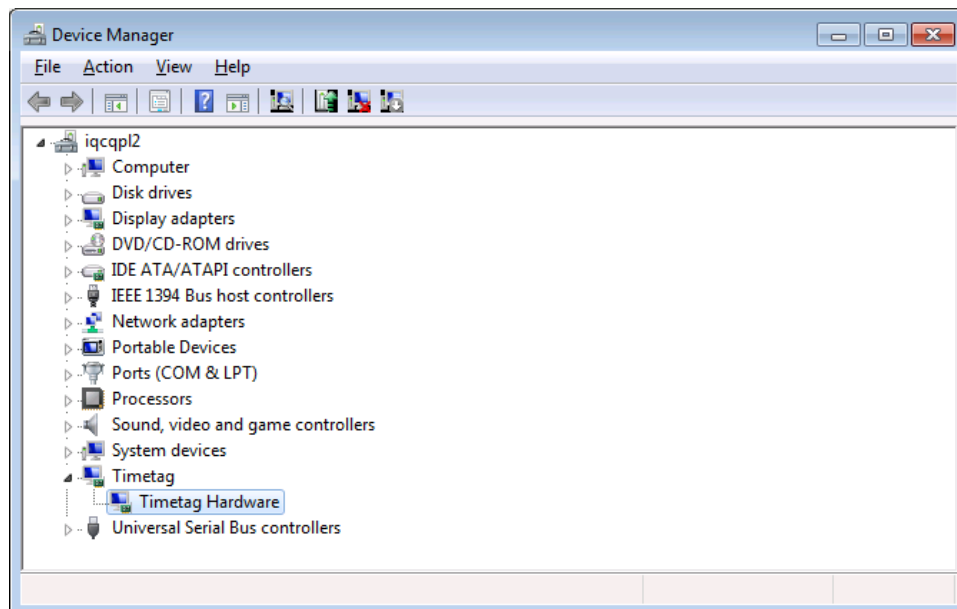
Installing the Coincidence Logic Unit driver

Install the driver

Power on the Coincidence Logic Unit and connect it to a USB 2.0 port on the computer (preferably not via a hub). As long as the unit has firmware 2.17.3 or above, Windows will detect the unit and install the driver automatically. Choose "yes" if Windows asks to connect to the Internet to find the driver. The screenshot below shows what will appear in Device Manger for a successful driver installation.

Remove old drivers

If the driver does not automatically install, there may be an old driver associated with the Coincidence Logic Unit. With the unit connected to USB and powered on, look in the Windows Device Manager for any device with "timetag" in the name and uninstall its driver. Older devices may be listed under different categories than the one shown here.

Testing the Coincidence Logic Unit

Power on the Coincidence Logic Unit and connect it to the computer, then run Timetag Explorer and click "Connect." The firmware version and timing resolution should show up in the right column. Put some signals into the unit's inputs and select "ReadTags" in Timetag Explorer to make sure it can read timetags. Try UseLogic in the Logic tab as well to read count and coincidence rates.

Updating the Coincidence Logic Unit's firmware

For best results it is important that the Coincidence Logic Unit is running the latest FPGA firmware (currently version 2.17.3). To check the firmware version using Timetag Explorer, click "connect" and the FPGA version is displayed in the right panel. The steps below show how to update the firmware. Needed items:

- Coincidence Logic Unit
- Small Phillips or flathead screw driver
- JTAG link cable (e.g. JTAG-cable Xilinx, Xilinx parallel cabel, HS2 Digilent)
- Xilinx Lab Tools – iMPACT
  - Free download from http://www.xilinx.com/ Choose Downloads, then ISE Design Tools and scroll down to the Lab Tools download
- Firmware PROM files provided by UQD
- TimeTagExplorer

Connecting JTAG Cable to Modules Manufactured after Jan. 2015

Connect JTAG Cable to the designated JTAG connector at rear of Coincidence Logic Unit, and to the computer.
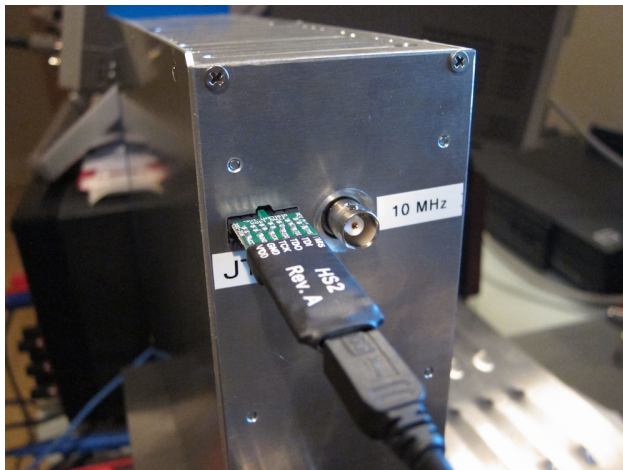

*Connecting JTAG Cable to Modules Manufactured before Jan. 2015*

Remove the screws on the side of the Coincidence Logic Unit, remove the panel, and connect the JTAG Cable to the FPGA board, to the computer, (and to its power supply if needed, which should cause the cable's light to come on).
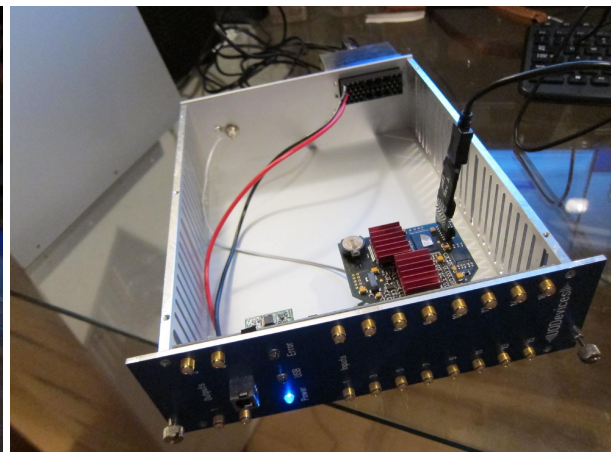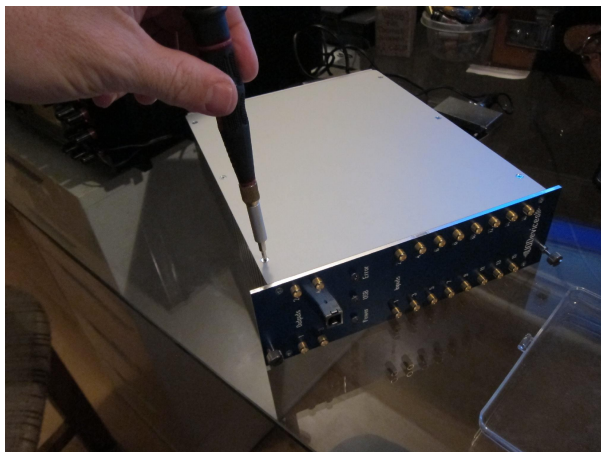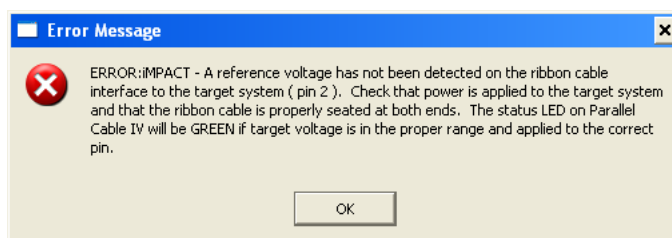
Connect the Coincidence Logic Unit to its NIM crate or separate power supply and power on the Unit. Run the program "Xilinx iMPACT" and choose "yes" to create a new project.
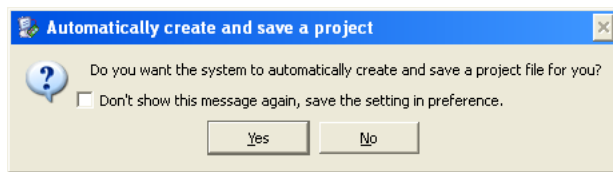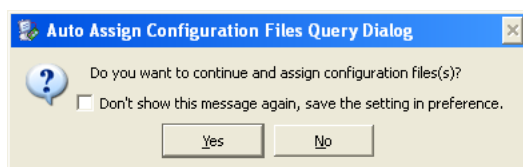

Choose "OK" to Configure devices using Boundary-Scan (JTAG).
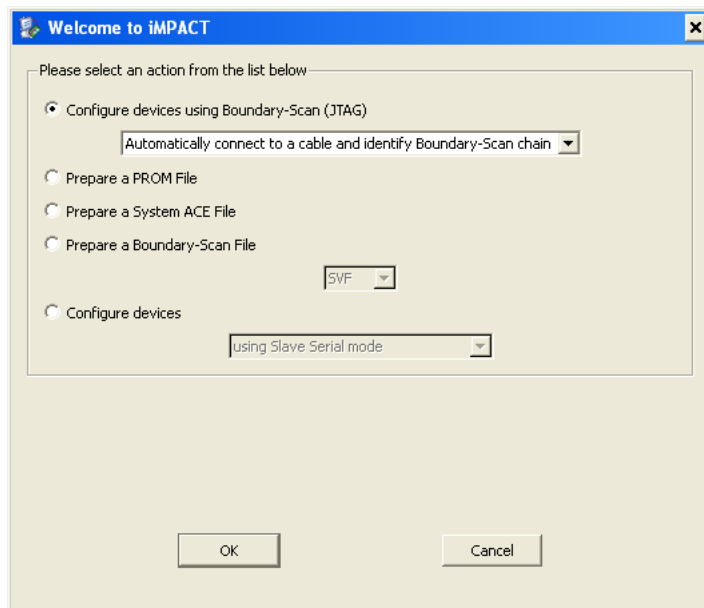
iMPACT will throw an error if the Coincidence Logic Unit is not powered on.


If iMPACT successfully connects to the Coincidence Logic Unit, it will ask to Auto Assign the configuration files. Choose "No".


Choose "Cancel" if a further window appears.

IMPACT will display two devices. Only the first will have its firmware updated. To do this, right click on the first device (xcf08p) and choose "Assign new configuration file". Choose the new firmware file (currently timetag217_3.mcs). Right click again on this device and choose "Program".
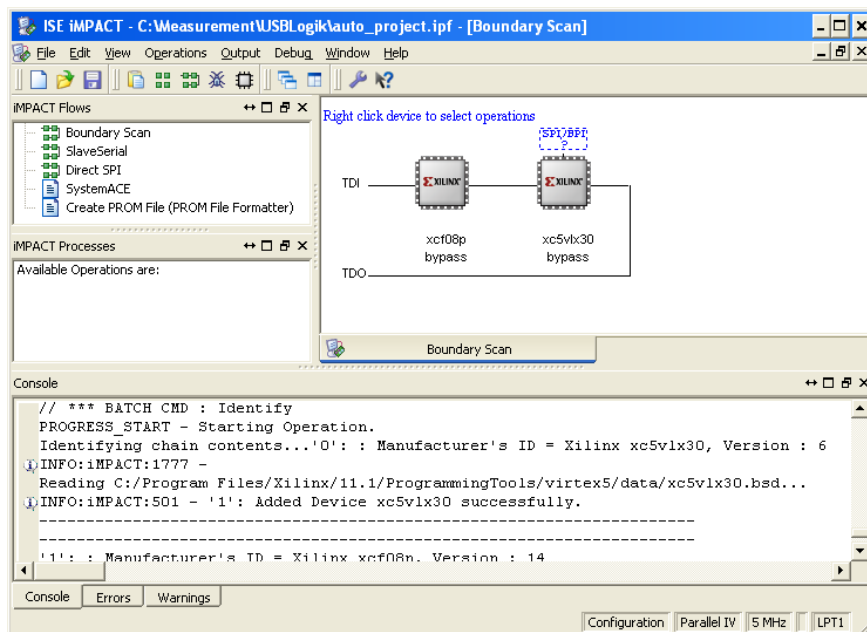
The device programming properties will open. Select the checkmark beside "Verify" and click "OK".
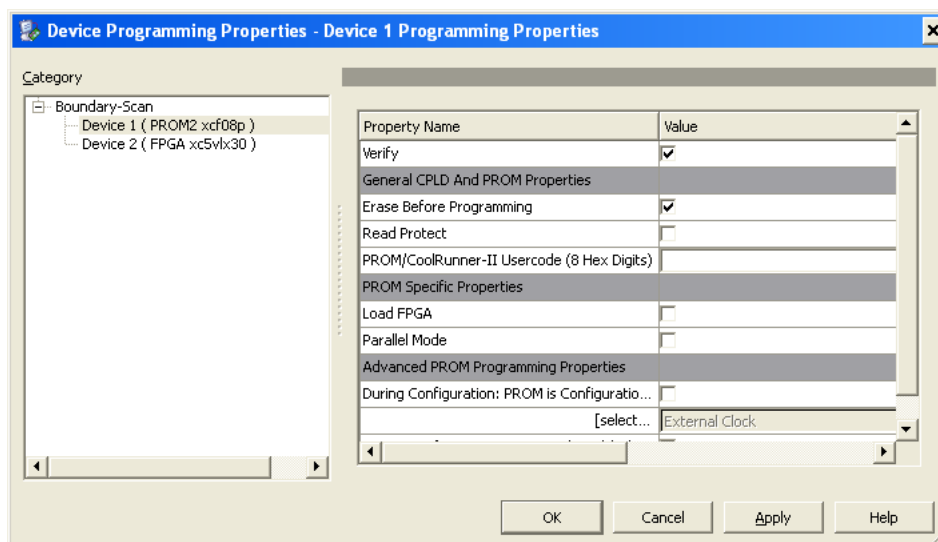
This will program the device with the new firmware. When "Program Succeeded" is displayed, close iMPACT, power down the Coincidence Logic Unit and disconnect the Xilinx Parallel Cable. Replace the side panel and the firmware update is complete. Reconnect power to the Coincidence Logic Unit to reboot the device, then check the firmware version with Timetag Explorer.