

onTAP HighSpeed USB JTAG Test & Programming Cable

Installation and Setup Instructions

Installing and Using the onTAP HighSpeed USB JTAG Test & Programming Cable

This guide is designed to assist with installation of the onTAP HighSpeed USB Cable. If you experience any problems or have technical questions regarding our boundary scan product, please contact our Technical Support department either by email at support@flynn.com or by phone at (603) 598-4444. We are happy to assist with your questions and your project.

The onTAP USB JTAG Test and Programming Cable and HighSpeed Usb JTAG Test and Programming Cable provide JTAG test and programming support for **onTAP Boundary Scan Software**. It is an ideal replacement for parallel port programming cables, offering higher speeds and simplified operation in both single and multiple chain (multiple cables) applications.

The cable may be used for the following applications:

- **JTAG Test, including memory and cluster test**
- **Flash programming**
- **FPGA, CPLD and PROM configuration**
- **General purpose I/O**
- **The HighSpeed cable also provides the capability to run two chains at speeds up to 30MHz.**

The onTAP HighSpeed USB Cable includes 2 ribbon cable headers for direct connection to Xilinx, Altera and other style headers or two flying lead connectors. The onTAP USB Cable attaches to a USB port on a PC with a Hi-Speed mini USB cable.



USB Cable Features

The onTAP HighSpeed USB Cable is available with a choice of fly leads, ribbon cable, Altera cable adapter, or custom adapters.

- Supported on onTAP and Windows XP - 7
- Attaches to USB ports and hubs with off-the-shelf Hi-Speed mini USB cables
- Dual channel
- Internally powered at 3.3V from USB ports and hubs.
- Includes adjustable internal voltage adjustment +1.8V - +4.5V
- Automatically senses and adapts to target I/O Voltages
- Interfaces to devices operating at 1.5 to 5.0 VDC; **MAX INPUT VOLTAGE IS 6V**
- JTAG pin currents +/- 24mA
- Adjustable TCK clock linearly from 280KHz to 15MHz and +28.8MHz
- Drivers provided
- Compatible with Xilinx Platform Cable USB flying wire leads and High Performance Ribbon Cable
- Cable adapter available for Altera and other custom headers
- JTAG pins compatible with the Xilinx Platform Cable USB, including TCK, TMS, TDI, and TDO.
- Tri-state, drive, and sense available on the INIT pin
- Hot plug and play
- Operates in onTAP single chain and multi-chain / multi-cable JTAG applications
- LED indicator shows status of both Vref and Cable voltages
- Suspend state or loss of Vref tri-states outputs on all pins
- Dimensions 3.54" x 1.97" x .94"

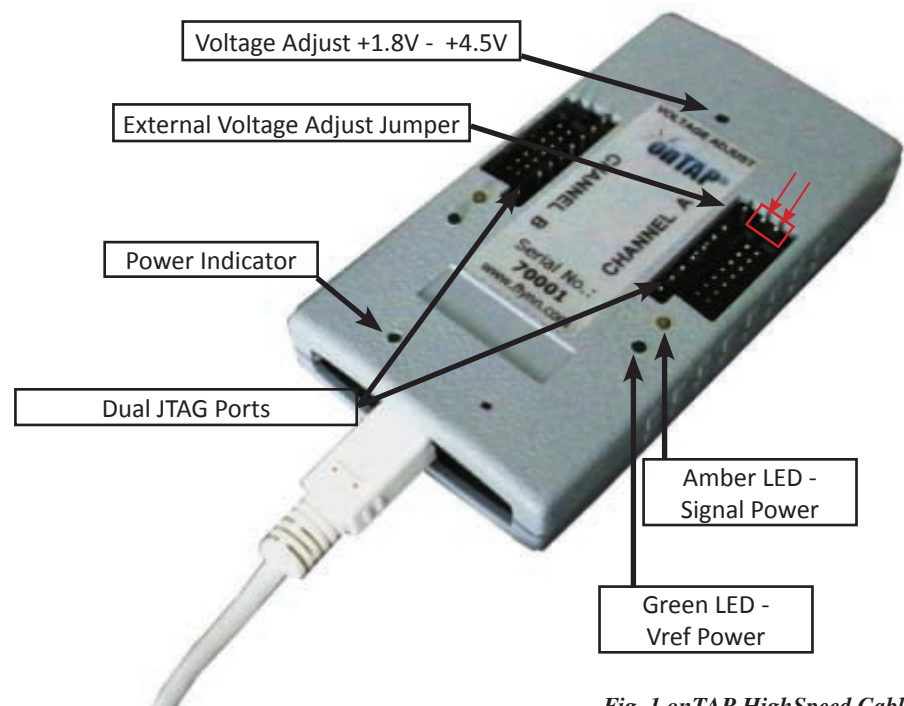


Fig. 1 onTAP HighSpeed Cable

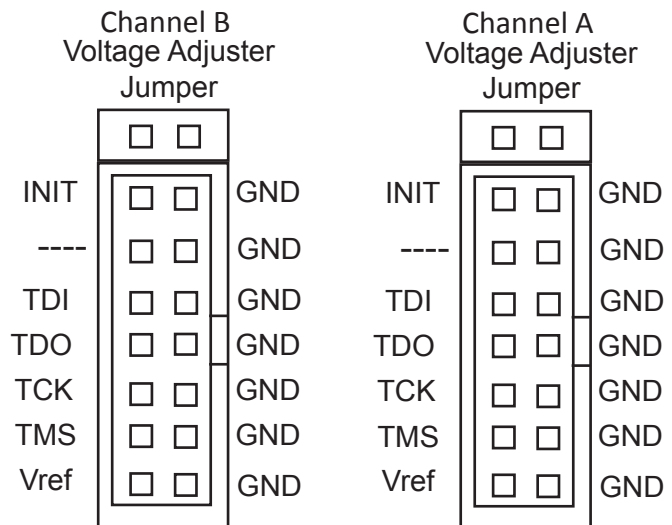
Ribbon Cable Connector & Flying Lead Pin Assignment



Typical Xilinx style flying leads



Typical Xilinx style ribbon cable



Pinout Assignments

Pin Name (JTAG)	Flying Lead Wire	Ribbon Cable	Description
TDI	2	10	Test Data In This is the target serial input data stream for JTAG operations and is connected to the TDI Pin on the first device in the JTAG chain
TDO	3	8	Test Data Out This is the target serial output data stream for JTAG operations and is connected to the TDO pin on the last device in the JTAG Chain
TCK	5	6	Test Clock This is the clock signal for JTAG operations and is connected to the TCK pin on all devices that share the same data stream
TMS	1	4	Test Mode Select This is the JTAG mode signal that establishes appropriate TAP state transition for the target devices which share the same data stream
INIT	4	14	Initialize This pin is available for general purpose I/O such as TRST (Test Reset) control or WE (Write-Enable) for FLASH Memory
Vref	7	2	Target Reference Voltage This pin should be connected to a voltage bus on the target system that supplies the JTAG interface
GND	6	1,3,5,7,9,11,13	Digital Ground All odd-numbered pins on the ribbon cable should be connected to digital ground, reducing crosstalk to a minimum

INSTALLING THE onTAP USB TEST AND PROGRAMMING CABLE WINDOWS VISTA AND XP

The onTAP HighSpeed USB Cable attaches to a PC with a mini USB cable. The driver for the cable is located in the ".../Program Files/onTAP/drivers" folder. When first attached, Windows should detect the new hardware and prompt you to install the new drivers.

The driver should be installed by following the instructions on the screen*, and letting Windows automatically locate and install the drivers.

The cable actually includes two devices: FT2232H Channel A and FT2232H Channel B. Both have to be installed, as the screens will indicate.

***TROUBLE SHOOTING THE CABLE INSTALLATION**

The new cable does not enumerate:

Sometimes when the older onTAP USB Cable has been previously installed on your PC, the PC may not recognize the new cable. To solve this problem, please disconnect the new HighSpeed USB cable, then open the device manager by going to Start----Control Panel----Device Manager and uninstall the old "onTAP USB Cable..." from the USB Devices list. Then, plug the HighSpeed USB cable back into the USB port, and your PC should begin the enumeration process.

If that does not work, what you may end up seeing in the Device Manager menu, under Universal Serial Bus section is shown in the series of screen shots on pages 5 and 6.

onTAP Does Not Recognize my Cable:

Please follow the steps outlined above. Odds are your cable is not being detected because the driver for the older onTAP USB Cable may be interfering with the new device.

I installed the new onTAP USB HighSpeed Cable, and Windows only shows the FT2232C Channel A and FT2232C Channel B:

Windows recognizes that you have plugged in the new onTAP HighSpeed USB Cable, however, it thinks that the driver is for the older cable.

To fix this, open the Control Panel, and select Universal Serial Bus controllers as indicated below in Illustration A.

Right click and select **Update Driver Software**.

Then follow the instructions on the following illustrations B and C.

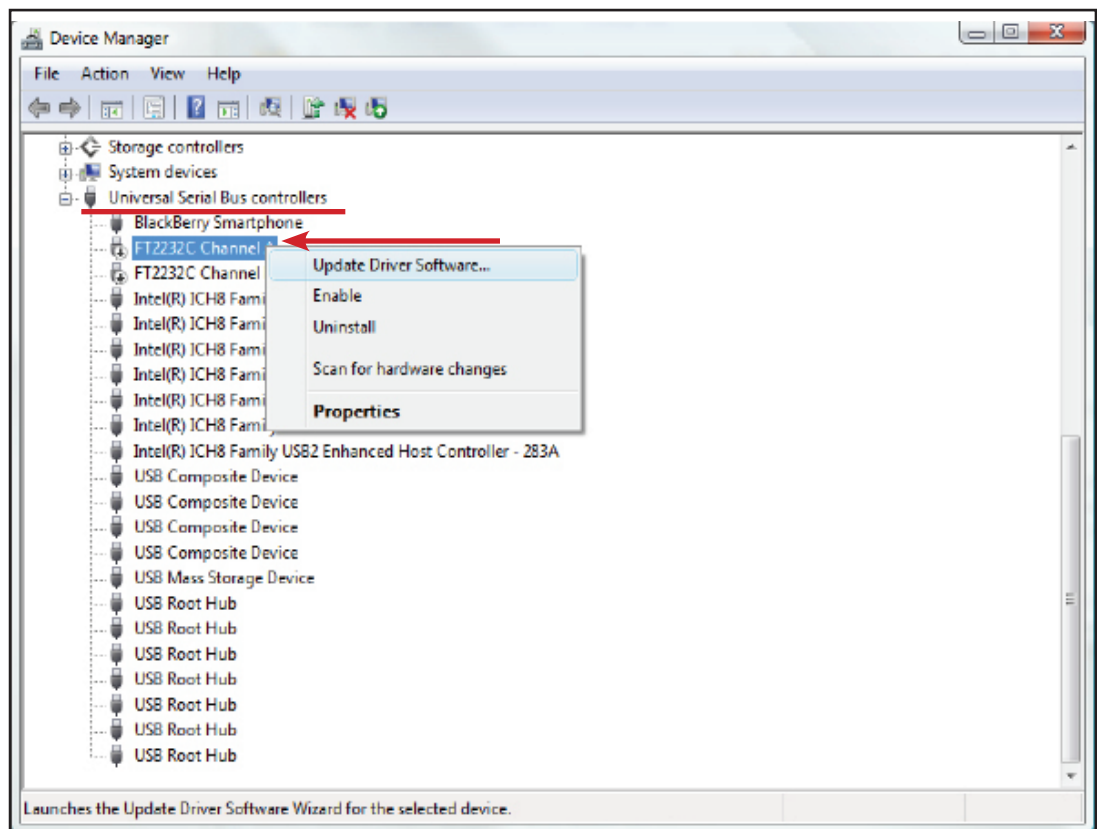


Illustration A. Associating the new HighSpeed Cable

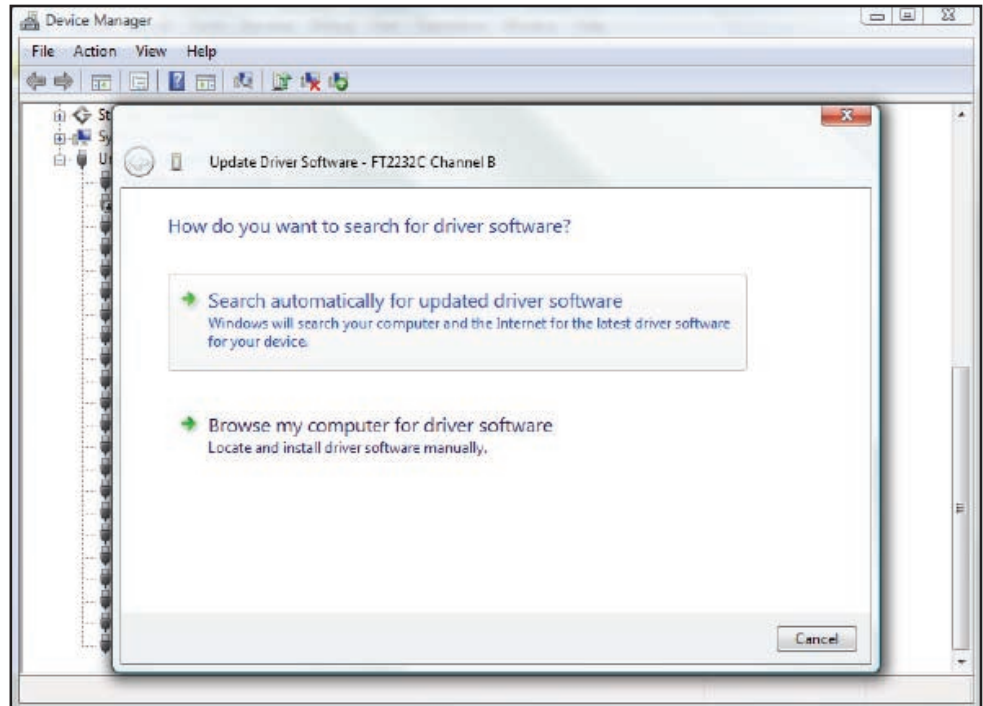


Illustration B. Let Windows locate and install the new High Speed Driver

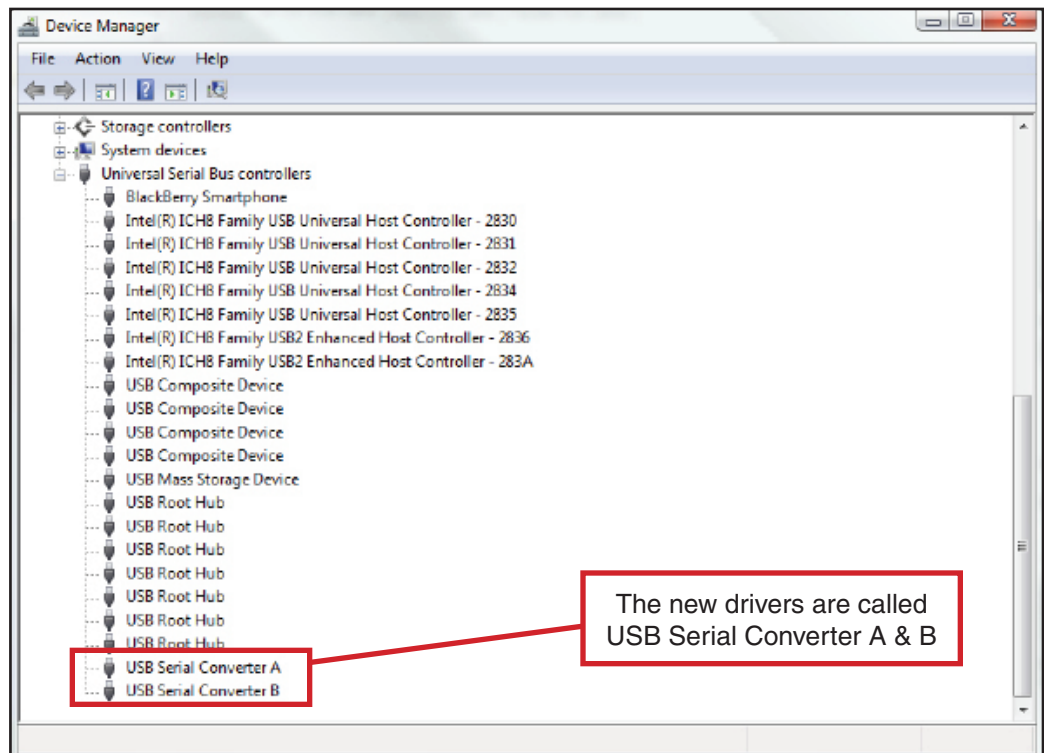


Illustration C. The new onTAP HighSpeed USB Cable drivers are installed

SETTING UP THE onTAP USB HIGHSPEED TEST AND PROGRAMMING CABLE

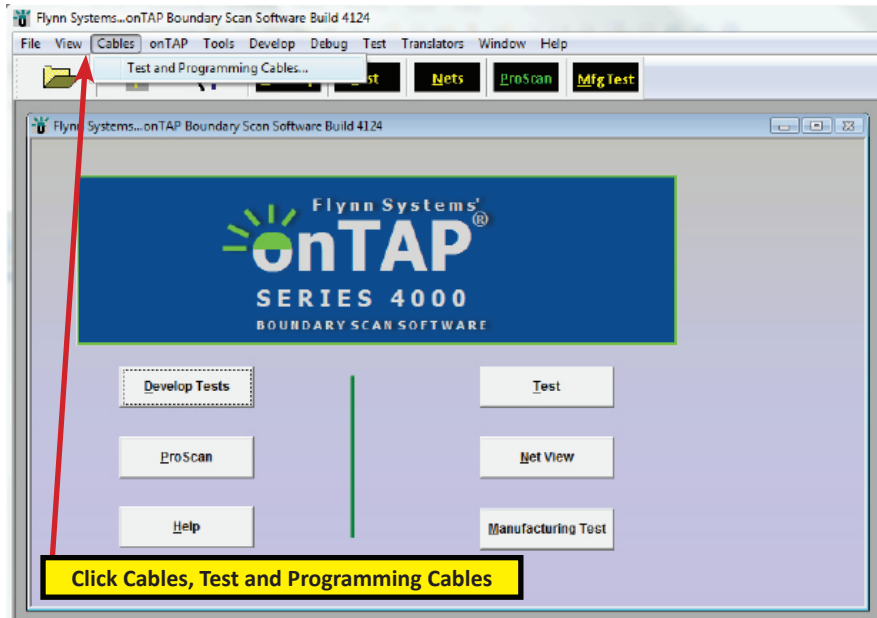


Fig. 2 onTAP Workspace

Select the Selection tab, then click the onTAP USB Cable radio button, then select the “onTAP USB Cable” tab.

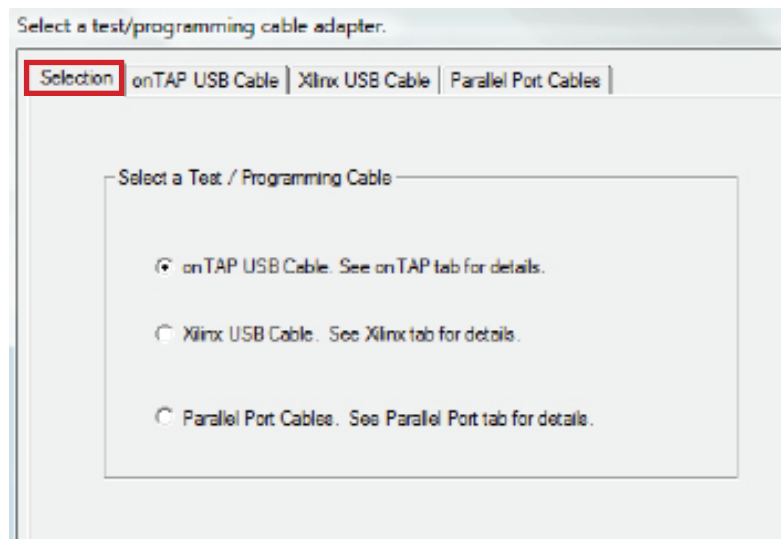


Fig. 3 onTAP Cable Selection

SETTING UP THE onTAP USB HIGHSPEED TEST AND PROGRAMMING CABLE (CONT'D)

The onTAP USB Cable tab should look like this. At this point, the USB cable is enabled and onTAP can run existing SVF files from any of the Test screens and from the Net Browser.

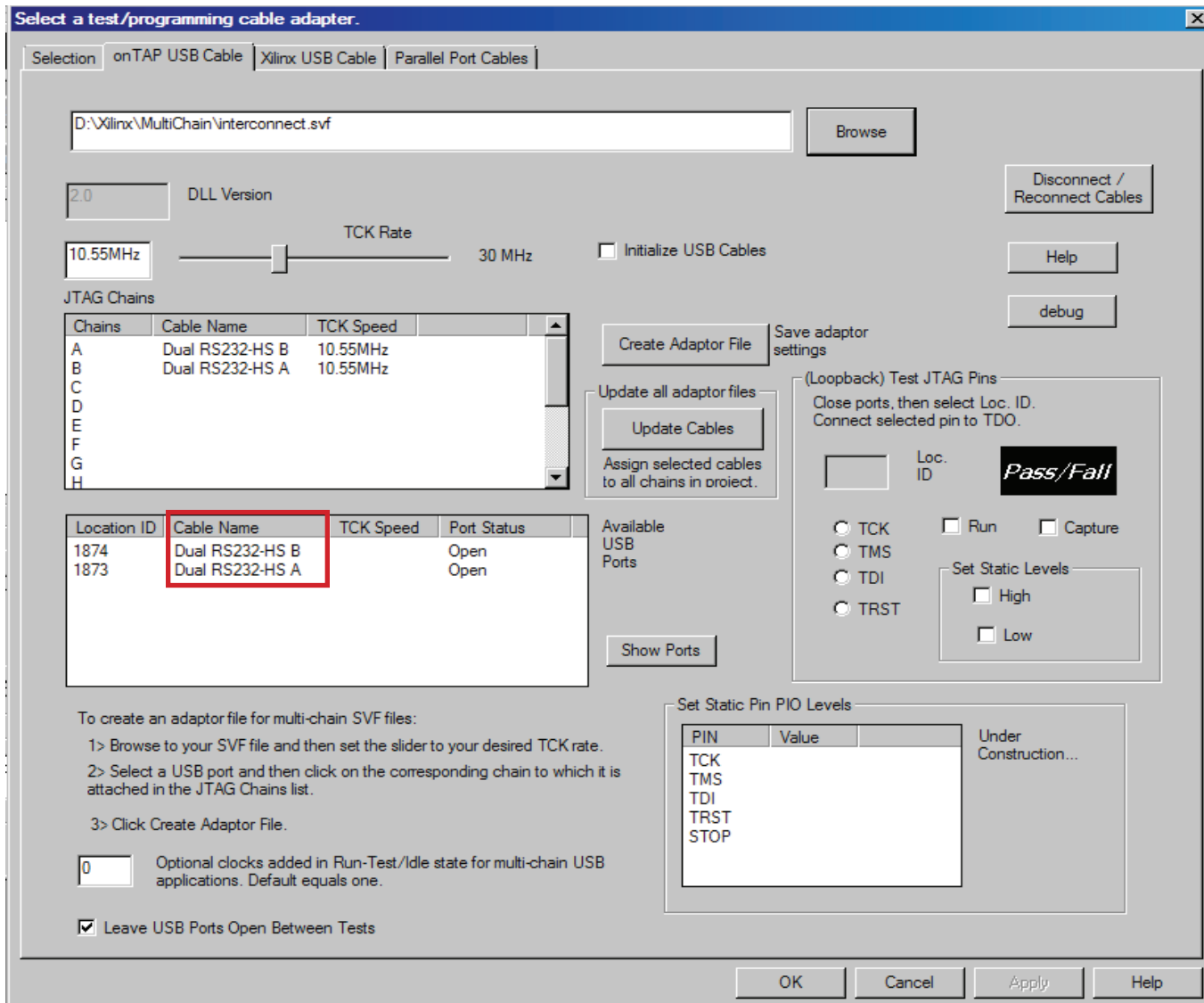


Fig. 4 onTAP USB Cable

If you have installed an older onTAP USB cable and your computer did not automatically recognize and update your new HighSpeed cable, you may have to manually update the drivers.

This can be accomplished by opening the device manager and searching through the USB Devices list for the FT2232C Channel A and Channel B. This is the older onTAP device. Once you locate these devices, right click them and select the option to automatically search for and install new drivers.

USING THE onTAP HIGHSPEED USB TEST AND PROGRAMMING CABLE

TCK Rate

To change the TCK rate, move the slider in the onTAP USB Cables tab. The selected rate appears in the edit box to the left. Note: some applications may run only at slower settings.

The TCK rate for this cable is linearly adjustable from 285KHz to 15MHz then it jumps to a maximum speed of 28.8MHz.

Because each channel is independent, both channels will and can run at speeds up to 28.8MHz

Cable Power and External VREF

The cable is self powered at 3.3V. However, if you are working with an application that does not have its own voltage reference, you can opt to use the voltage adjustment. Refer to **Fig.5**

By placing a shunt on the two voltage adjustment pins, you will activate this control. Then attach a scope to the VREF pin and use a small flat head screwdriver to adjust the voltage screw.

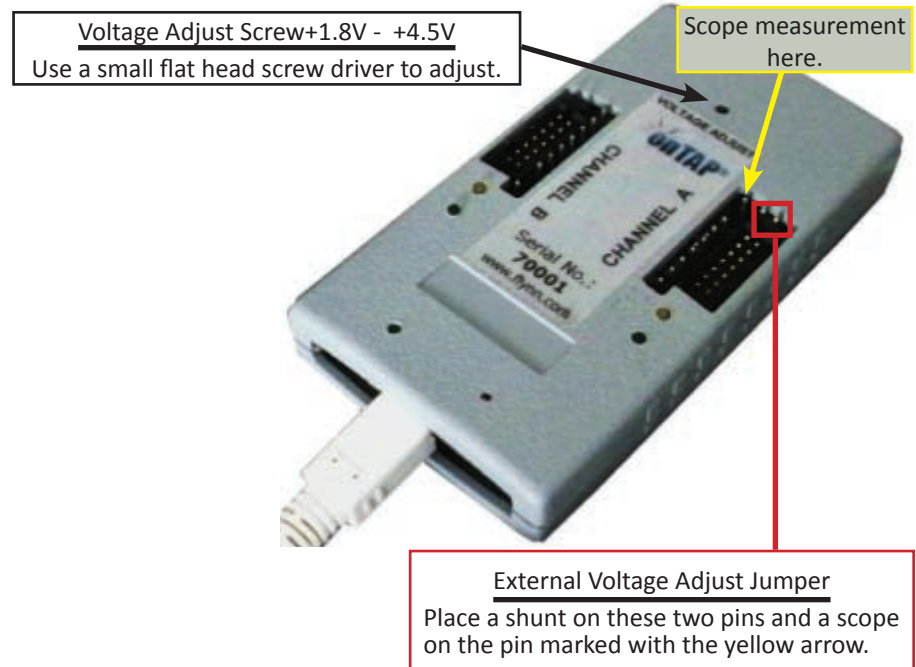


Fig. 5 Using the onTAP USB Cable

Procedures for Single and Multiple chain Applications

onTAP will run with the adaptor file created for single-chain applications. When using USB cables for multiple chain applications, the following procedure is required:

- Create a new SVF file after selecting USB onTAP on the Development screen's Adaptors page.
- Open the "onTAP USB Cable" dialogue shown in **Fig. 4** p.6 and browse to the SVF file. The chains should appear in the JTAG Chains list and the available USB cables should appear in the list below the chains.
- Select a cable and then select a chain to associate a cable and chain. Click on the TCK Rate slider to select a speed setting.
- Click "Create Adaptor File" to create a USB adaptor file.

Procedure to Test a Cable

- Select a USB cable.
- In the "(Loopback) Test JTAG Pins" control group, select a TAP pin. While Vref and GND are connected to the cable and the TAP pin is looped back to TDO, select "Run." A PASS or FAIL result will be indicated. Static level may also be set as indicated.

Support Policy License Terms

Each onTAP Boundary Scan USB Cable is intended for use solely with onTAP Boundary Scan Software. Support for the onTAP USB Cable is available only when said cable is used in conjunction with onTAP Boundary Scan Software and only when Support Agreements are active and current.

Each onTAP Boundary Scan USB Cable provides JTAG test and programming support for onTAP boundary-scan software. The onTAP USB Adaptor is intended to be compatible at a pin level with the Xilinx Platform USB cable, simplifying selection of attachment adapters to a user's target board. It attaches to the USB port on a PC with a standard Hi-Speed mini USB cable.

The Software, License (including all documentation and materials), and hardware may not be sublicensed, published, released or transferred to any other party by Customer without prior written consent of Flynn Systems Corporation (FSC).

All onTAP-related hardware is under warranty for a period of one year after the date of initial purchase. Defective equipment returned to Flynn Systems Corp. during the warranty period will be replaced or repaired at our discretion at no cost. Fees will be assessed for any and all hardware failures that occur after the expiration of the warranty period. Fee structure for any such replacement is at the sole discretion of Flynn Systems Corp. and its representatives. Before new hardware will be issued, inoperative items must first be returned to Flynn Systems Corp. or its representatives.