XDS100V2

Product description

DSP emulator

XDS100V2 official version

Support TI DSP ARM

CCSV4 and higher versions are supported, CCSV3.3 is not supported!

Simulation debugger XDS100V2 supports DSP TMS320F28335 upgraded high-speed interface

产品介绍

XDS100V2 仿真器是XDS100V1仿真器的升级版，是XDS100 JTAG仿真技术的第二个版本，与XDS100V1相比XDS100V2的速度更快，支持的DSP芯片型号也更多，还支持TI的ARM芯片，是一款性价比非常高的DSP仿真器。

XDS100V2 仿真器支持USB2.0高速接口，通过14PIN的接口进行仿真调试，支持Code Composer Studio（CCS）V4 和更高的版本。

产品特点

<1>USB2.0 高速接口 (480 Mbit/s)
<2>14PIN的标准JTAG接口
<3>支持高速USB代码下载功能
<4>支持断电检测
<5>支持多种 FTDI 设备驱动
<6>支持自适应时钟
<7>支持的Code Composer Studio v4(CCS4)和更高版本
<8>支持LED灯显示控制USB连接情况

✓**TMS320C28x** 系列
常见有：TMS320F2812、TMS320F2810 、TMS320F28335、TMS320F2802、TMS320F2806、TMS320F2808、TMS320F2809、TMS320F28232、TMS320F28027、TMS320F28035 等等
✓**TMS320C54x** 系列
常见有：TMS320C5402、TMS320C5409、TMS320C5416等
✓**TMS320C55x** 系列
常见有：TMS320C5502、TMS320C5509、TMS320C5509A等
✓**TMS320C64x+**系列
常见有：TMS320C6421、TMS320C6424、TMS320C6455等
✓**TMS320C674x**系列
常见有：TMS320C6745、TMS320C6747、TMS320C6748等
✓**ARM 9**系列
✓**ARM Cortex R4**系列
✓**ARM Cortex A8**系列

Support WINXP/7/10 32&64bit
Simulation debugging:

The internal circuit is exactly the same as the original:
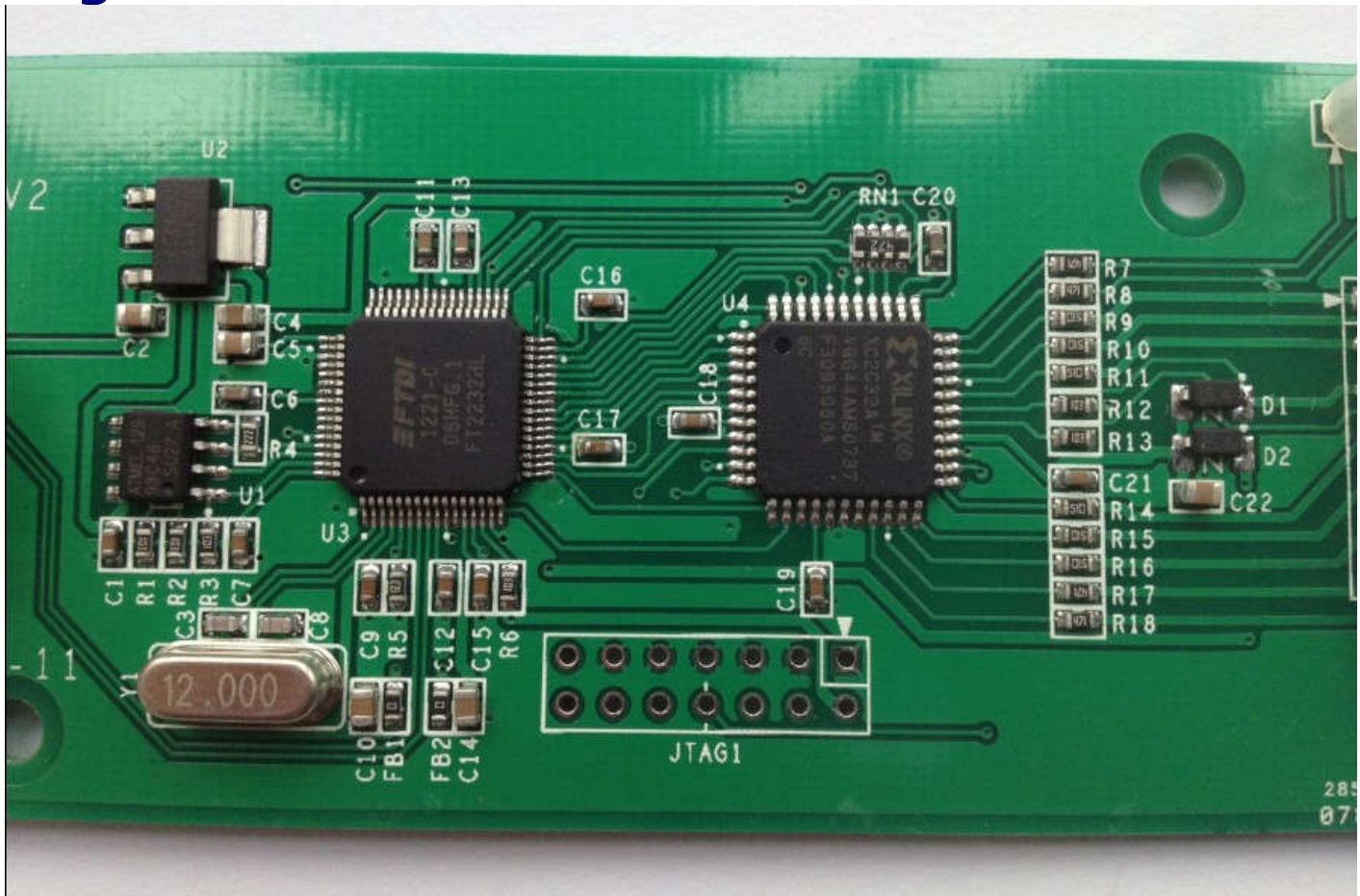
Packing List:
1. 1 host
2. 1 USB cable as a gift
3. One 14P gray cable is given as a gift
The CCS software can be downloaded from the TI official website (you can register an account), and the driver is integrated (copied to the browser):
http://processors.wiki.ti.com/index.php/Download_CCS
Reference material download address (copy to browser):
http://pan.baidu.com/s/1mgDQeUW

Support Chip:

1, TMS320C28x series

2, TMS320C54x series

3, TMS320C55x series

4, TMS320C64x + Series

5, TMS320C674x series

6, TMS320C66x series

7, ARM 9 Series

8, ARM Cortex A9 Series

9, ARM Cortex A8 Series

10, ARM Cortex M3/M4 Series

11, ARM Cortex R4 Series

Product Features:

1 , debug function (connect / disconnect , read / write memory , read registers, loader , run / stop steps to support the breakpoint debugging , real-time mode) .

2, USB2.0 high speed interface, compatible with USB 2.0 full-speed , and low-speed USB1.1 .

3,14 PIN standard JTAG interface, support for TI chip processor .

4, support Hi-Speed USB code download.

5 , support for power-on reset startup mode , JTAG reset , wait and then reset the startup mode.

6 , support for outage detection .

7 , support for multiple FTDI device driver .

8, support adaptive clock , adaptive target board voltage.

9 , support for Code Composer Studio v4 and later versions , the latest version CCS5.2 has passed rigorous testing.

10 LED lights display controller supports USB connections.

11, SRV05-4 do ESD protection . Protect expensive DSP chip to prevent static electricity from the human body burn JTAG DSP chip .

FY-XDS100V2 仿真器输出接口:

设备输出默认标准的 14 针 JTAG 口
定义如下:

TMS	1	2	/TEST
TDI	3	4	GND
PD(+3.3V)	5	6	KEY
TDO	7	8	GND
TCK-RET	9	10	GND
TCK	11	12	GND
EMU0	13	14	EMU1

其中第 9 脚即 RTCK

注意: 下载器不向外提供电源: 其中 5 脚不输出电源,此脚需要接目标板的电源,否则无法工作!

设备对应:
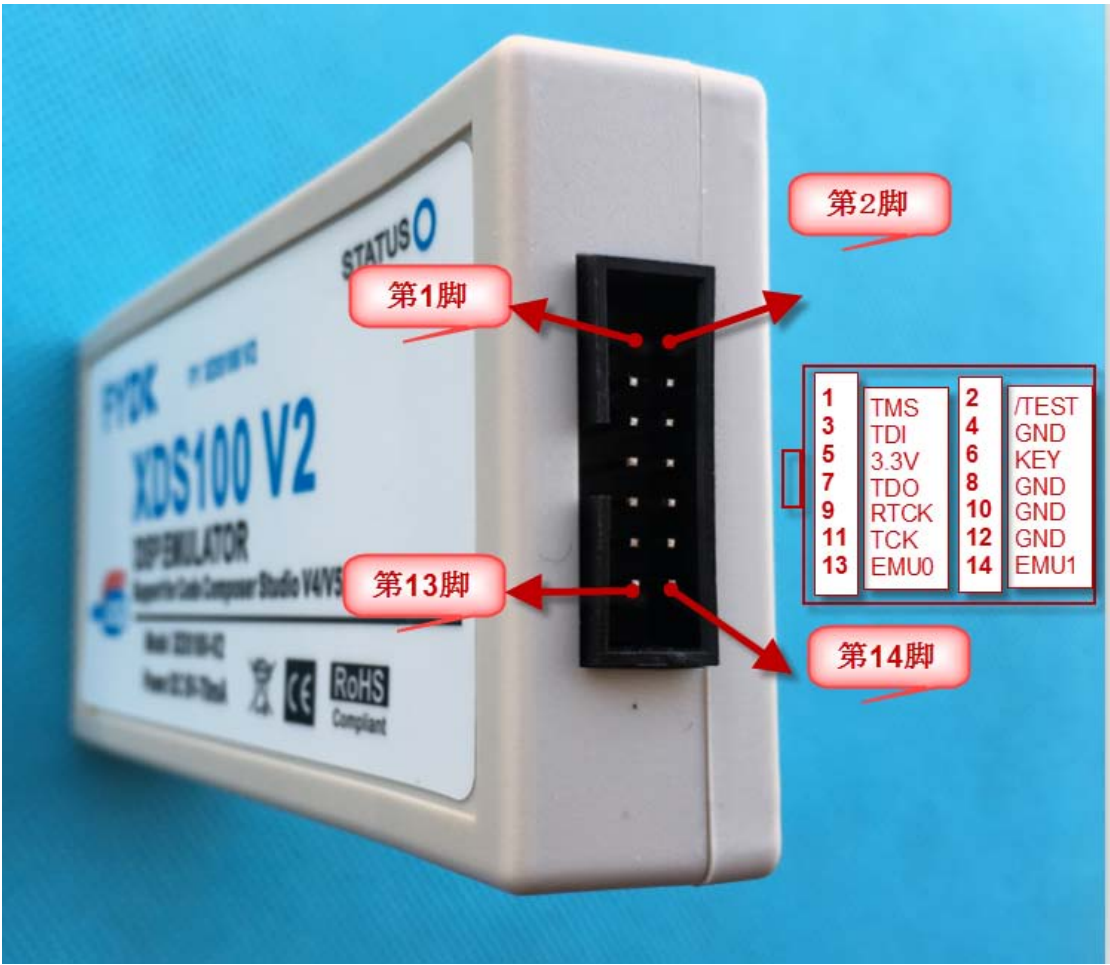
14P 排线识别:

排线输出引脚顺序:

如何识别第 1 脚:
三角形位置为 1 脚,一排顺下来是单数 1.3.5.7.9...........
另一排顺下来是双数: 2.4.6.8.10.12...........

第20脚

第2脚

第1脚

第19脚

三角形标识处为第1脚

Contents

What is the XDS100?

- The XDS100 emulator is Texas Instruments' ultra-low-cost USB-interface JTAG hardware reference design.
- The XDS100 emulator provides JTAG access to Texas Instruments' JTAG based devices.
- It is compatible with Code Composer Studio? development environment.
- The hardware is manufactured by TI 3rd parties.
- The XDS100 is available as a discrete emulator, or can be embedded on a development card (DSK, EVM, etc.).
- There are 2 versions of the XDS100: 1) XDS100v1 and 2) XDS100v2. The XDS100v1 is the original XDS100 design. The XDS100v2 is an updated XDS100 design with more capabilitiy.
- Performance of the XDS100 is lower than the XDS510 and XDS560. This means that program and data downloads will take a longer time than with XDS510 and XDS560 emulators. Also, stepping in "C" and "Assembly" will be slower with XDS100 when compared to XDS510 or XDS560 emulators.

General Features

The Texas Instruments' reference design for both the XDS100v1 and XDS100v2 have the following features (Please check your vendor for hardware details):

- Debug features (Emulation Connect/Disconnect, Read/Write memory, Read registers, Load program, Run, Halt, Step, Software and Hardware Breakpoint support, Real-Time Mode)
- Compatible with Code Composer Studio?.
- Support for targets with 1.8v and 3.3v IO voltages.
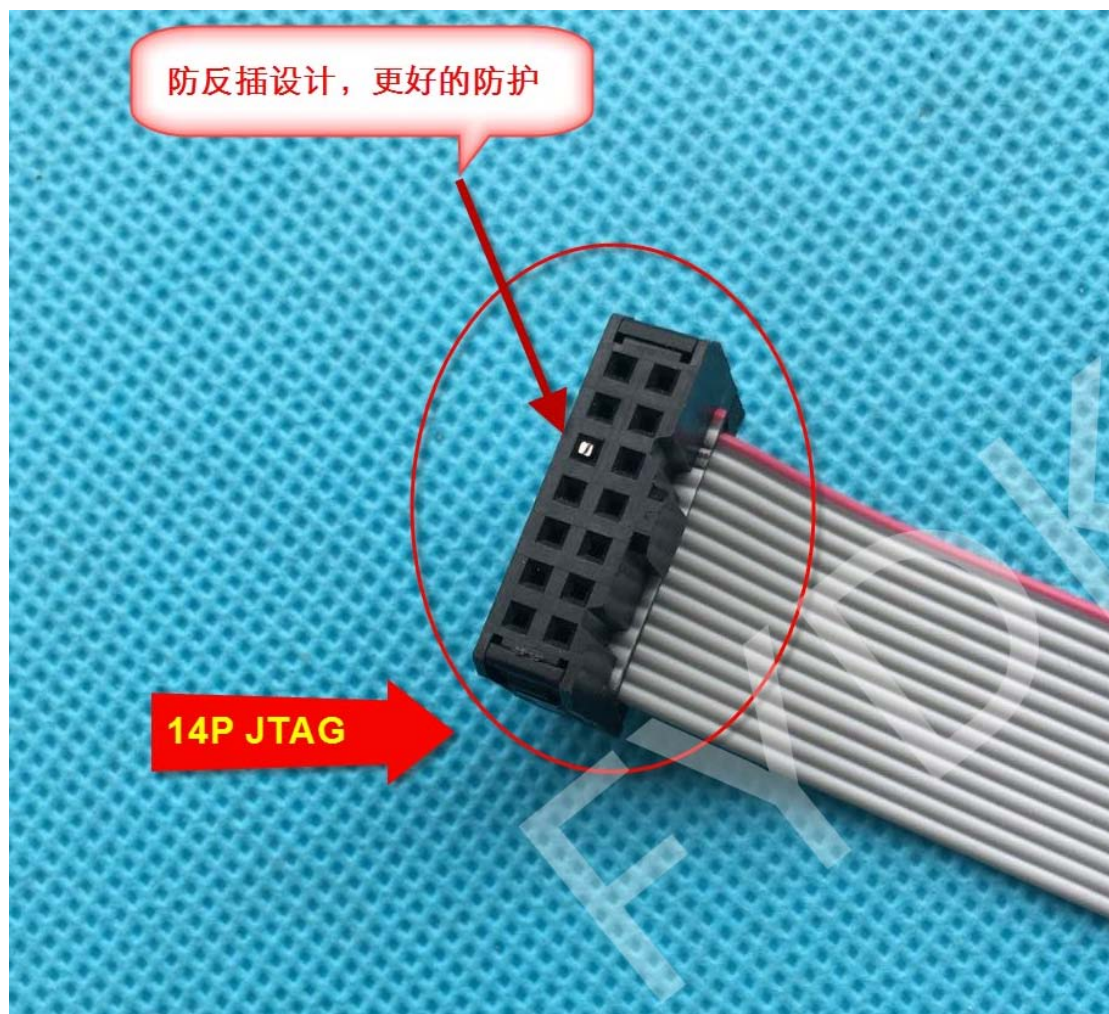- Support for "JTAG reset"/"wait-in-reset" boot-modes using the two EMU pins sampled by the nTRST pin.
- Support for "Power-on reset" boot-modes using the two EMU pins sampled by the TVD pin.
- Support for the configuration of the EMU pin features through Code Composer Studio? Setup "connection properties" dialogs similar to those for the XDS560 Rev-D cable.
- Support for "target power-loss detection" via the TVD pin even when Code Composer Studio? is not running, and applying boot-modes at Code Composer Studio? start-up.

XDS100v1 Features

The Texas Instrument' reference design for XDS100v1 has the following features. Please check with your vendor as to whether the all of the below features are supported:

- All of the XDS100#General_Capabilities
- Support for USB Full Speed (12 Mbits/s)
- Support for multiple FTDI devices (CCSv4 only)
- Support targets with 14-pin TI JTAG connector used by Texas Instruments embedded processors.
- Support for the following processors cores: TMS320C28x, TMS320C54x, TMS320C55x, TMS320C64x+, and TMS320C674x

XDS100v2 Features

The Texas Instrument' reference design for XDS100v2 has the following features. Please check with your vendor as to whether the all of the below features are supported:

- All of the XDS100#General_Capabilities
- Support for USB High Speed (480 Mbit/s)
- Support targets with 14-pin TI JTAG connector or 20-pin TI JTAG connector as used by Texas Instruments embedded processors. (Please check your vendor for hardware details)
- Support for the following processor cores: TMS320C28x, TMS320C54x, TMS320C55x, TMS320C64x+, TMS320C674x, ARM 9, ARM Cortex R4, and ARM Cortex A8.
- Supports cable-break detection
- Support for multiple FTDI devices
- Adaptive clocking (supported but not fully validated)
- LED light to indicate active USB connection
- Support for Code Composer Studio v4 and newer (Does not support Code Composer Studio v3.3)

Features NOT supported

- It does not support <u>Real Time Data eXchange (RTDX)</u> or <u>High Speed RTDX (HSRTDX)</u>
- It does not provide hardware support for TCLKR external clocking
- Cores NOT supported: ARM 7, ARM 11, ARM Cortex M3, TMS320C24x, TMS320C55x+, TMS320C670x, TMS320C671x, TMS320C672x, TMS320C64x (note that TMS320C64x+ is supported) and other cores not listed as supported.
- It cannot read the value of the EMU0/1 pins, so long profiling operations that use the EMU0/1 pins to handle counter overflows will not be possible.
- JTAG Clock (TCLK) frequency other than default JTAG frequency (1Mhz)

XDS100 Installation Instructions

Installation for Code Composer Studio v4.1

Code Composer Studio v4.1 Support (XDS100v1 and XDS100v2 hardware)			
Processor Family	XDS100 Hardware Version	*Code Composer Studio Release/Version*	*Notes*
TMS320C28xx	v1, v2	<u>Code Composer Studio v4.1</u>	No additional SW required for XDS100 support
TMS320C54xx	v1, v2	- as above -	
TMS320C55xx	v1, v2	- as above -	
TMS320C674x	v1, v2	- as above -	
TMS320C64x+	v1, v2	- as above -	
ARM9	v2	- as above -	
ARM Cortex A8	v2	- as above -	
ARM Cortex R4	v2	- as above -	

A. Install Code Composer Studio 4.1 (XDS100 SW support is included) as per the table above **before** connecting XDS100 USB hardware.

B. Connect the XDS100 hardware

1. Make sure the Code Composer Studio 4.1 is installed FIRST **before** plugging in the XDS100 HW to the PC.
2. Connect USB cable from the PC to the XDS100 hardware. Connect the JTAG to the target board (be careful to plug it in correctly: pin 1 should go to pin 1. Red strip usually indicates the side of pin 1)
3. You will notice small popups to inform user that USB hardware is recognized and installed correctly. No input are required.

C. Setup Code Composer Studio v4.1

1. Start Code Composer Studio and create a new target configuration. See <u>Quick Tips#Target_Setup.C2.A0</u>
2. Select XDS100 as connection type (either XDS100 v1 or XDS100 v2)
3. Select device.

Installation for Code Composer Studio v3.3 (XDS100v1 Hardware Only)

Code Composer Studio v3.3 Support (XDS100v1 HW only)			
Processor Family	XDS100 Hardware Version	*Code Composer Studio Release/Version*	*Notes*
TMS320C28xx	v1	CCS v3.3 Platinum Edition (TI part #: TMDSCCSALL-1)	Included with <u>CCS Service Release 12</u> and newer.
TMS320C28xx	v1	<u>CCS v3.3 for C2000 Full Version (version #3.3.78.2) (TI part #: TMDSCCS2000-1)</u>	XDS100 SW required. Download <u>here</u>.
TMS320C28xx	v1	CCS v3.3 for C2000 DSK Version (version #3.3.81.28, 3.3.83.16 or newer)	XDS100 SW included in CCS Installation. No additional SW required.
TMS320C674x	v1	CCS v3.3 Platinum Edition (TI part #: TMDSCCSALL-1)	Included with CCS Service Release 12 and newer.

XDS100

Note: Code Composer Studio v3.3 ONLY supports XDS100v1 hardware emulator. <u>XDS100v2 hardware is NOT supported on Code Composer Studio v3.3.</u>

A. Install Code Composer Studio and XDS100 Software before connecting XDS100 USB hardware.

    1. Install the Code Composer Studio version, service release and/or XDS100 SW as detailed in the table below prior to connecting the XDS100 SW.

B. Connect the XDS100 hardware

    1. Make sure the XDS100 Software is installed FIRST per the table above **<u>before</u>** plugging in the XDS100 HW to the PC.
    2. Connect USB cable from the PC to the XDS100 hardware. Connect the JTAG to the target board (be careful to plug it in correctly: pin 1 should go to pin 1. Red strip usually indicates the side of pin 1)
    3. You will notice small popups to inform user that USB hardware is recognized and installed correctly. No input are required.

C. Setup Code Composer Studio v3.3

    1. Select CC Setup icon from the desktop.
    2. From the filters panel, select the platform "xds100usb emulator". This will give you a list of predefined configurations. Select the one appropriate for your device
    3. Save your configuration and exit CC Setup
    4. Start Code Composer Studio
    5. In Code Composer Studio, go Debug-->Connect. Note: "connect to target" may take long time (>5 seconds) for the first time XDS100 USB is connected to target. It is not the case with subsequent "connect" operations.

What are the known issues?

- While loading a large program or program section, the file load status bar may appear frozen when it is not frozen. The status bar is showing section load start and completion.
- When a second FTDI device is plugged in (ex: FT232RL), and it receives a lower chain number, the XDS100 SW will address it instead of the FT2232 used by the XDS100. Solution: only plug the XDS100 HW into the PC. This has been fixed with <u>Code Composer Studio v4</u> support for the XDS100v2.
- XDS100 SW Driver does not install properly under Windows Vista 64 bit using CCSv3.3
- If "Option" under CCSv3.3 "connect to target at CCS startup" is enabled and c674x target board is connected, then the following error is reported when you try to "Disconnect" for the 1st time. It works fine on 2nd attempt to disconnect. Note, this has been fixed for CCS v4.

    Error:

        Error 0xA0002020/-150
        Error during: Execution, Control,
        This error was generated by TI's USCIF driver.

        SC_ERR_POD_FAIL <-150>
        This utility failed to operate the adapter for a custom emulator.
        The adapter returned an error for unknown reasons.

- When selecting OMAPL137 configuration in CCS 4.0.2, the GEL files cause the connection to be hung. Remove the GEL file from the target configuration.
- ETB for OMAPL137/8 is not working. Error of "ETB definitions cannot be loaded. Device not supported." is reported. ETB11 for OMAPL137/138 is not supported at this time.
- When installating XDS100v2 patch via update manager, CCS says that the feature is not digitally signed. Continue installation.

Troubleshooting

- Check whether the installation process was followed.
- Please check the FAQ questions below.
- Please check the section regarding <u>Debugging JTAG Connectivty Problems</u>.
- Check your Windows System Devices. When properly installed, the XDS100 should look like the below image. If the XDS100 does not show up in the Windows device manager, then it is likely that the XDS100 was not programmed properly (contact manufacturer) or that there is a conflict with another FTDI based USB device (see FAQ below for details).
- Check USB cable
- Power cycle your target
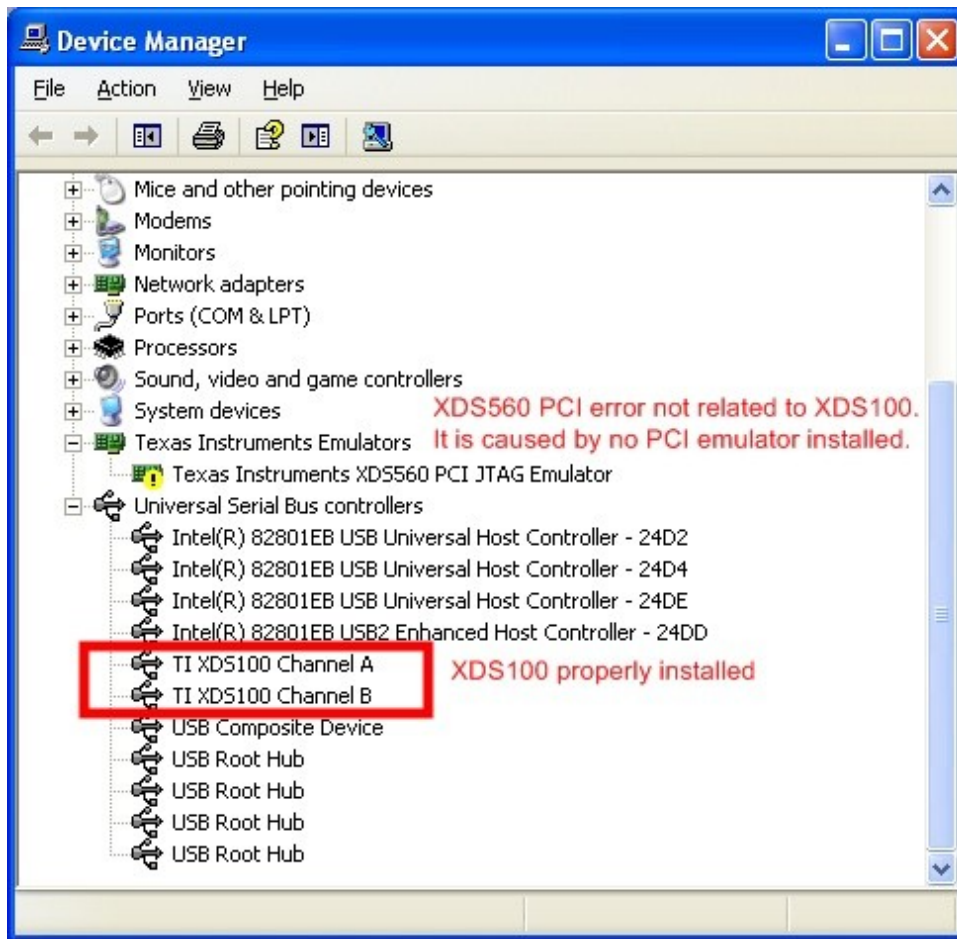
Roadmap

- SW Update for inclusion of the XDS100v2 SW patch into CCS v4.1.
- SW Update for XDS100v2 Hardware to support ARM7, ARM Cortex A9, ETB
- IEEE 1149.7 support

Where to get an XDS100 / Where to buy an XDS100

XDS100v2

- Ashling's Opella-XDS100v2 is now available. Check it out here and buy here
- Blackhawk has one available
- Embest has one [here]
- Spectrum Digital, Inc., offers an XDS100v2 USB JTAG Emulator here
- TI Estore has a 14 pin TI or a 20 pin compact TI version available.

XDS100v1

- Blackhawk offers a USB 2.0 HIGH-SPEED XDS100-class JTAG Emulator with dual headers (14 and 20cTI) here
- Olimex offers an XDS100 emulator here.
- Realtime offers an XDS100 emulator here.
- SeedDSP offers an XDS100 emulator here and here.
- C28x has the XDS100 is integrated onto the c28x Piccolo controlstick here and here.
- 5505 has the XDS100 integegrated onto the 5505 eZDSP USB stickhere
- ZLG (China)
- Bilkon
- Pantech Solution Pvt Ltd.

Troubleshooting   5

- Lierda has one (China)

How to make an XDS100 / How to build an XDS100 hardware emulator

- You can make your own XDS100 by using the schematic and programming instructions below.

XDS100v2 (Recommended)

Q: Where can I get the design / schematic / BOM for the XDS100v2?

- A: It is available from here (registration required).
- The design files (schematic, gerbers, etc.) are drawn in the program KiCAD. PDF schematic is included. Bill of Materials (BOM) is included. MPROG script file is included. CPLD VHD and JED sources are included.
- Please read the included readme for details.

Q: What should the USB device's UID be?

- A: The EEPROM needs to be programmed for a VID=0403 PID=A6D0. The device name string should be, "Texas Instruments Inc.XDS100 Ver 2.0".
- A: FTDI has a utility called MProg. See here. A sample MPROG file is included in the XDS100v2 design package.

Q: I want to put an XDS100v2 on my EVM / DSK / card. Can I do this?

- A: Yes, but please make sure to re-use the entire XDS100 design as-is to ensure compatibility with the software! Removing the CPLD implementing with discrete logic will result in a design that is just as complex and expensive as using the CPLD.

Q: Can I use port B as a UART?

- A: Yes. The TI XDS100v2 reference design uses the port A of the FTDI2232H to be for JTAG. This leaves the port B available for use either to program the CPLD and/or for use as a UART. The XDS100v2 design puts the CPLD JTAG programming on a selected number of pins (see XDS100v2 readme for details). This allows the CPLD to be programmed via the FTDI device, greatly simplifying manufacturing.
- Please note that there is a known issue with the current XDS100v2 reference design with the placement of the BCBUS. If you plan to use the port B, please check the readme of the XDS100v2 reference design for details. Generally, a serial port on BCBUS should connect the CPLD as follows: BCBUS1 -> CPLD TCK, BCBUS2 -> CPLD TDI, BCBUS5 -> CPLD TDO, BCBUS6 -> CPLD TMS.
- Please note that using UART mode simultaneously with Code Composer Studio v4 has NOT been tested on the XDS100v2 design and is not officially supported. Experience with C2000 ControlCards which implement this functionality indicate the FTDI driver can handle such an interaction. *The C2000 control card does implement a serial port simultaneous with JTAG, but it is done with an XDS100v1 design. There is a thread on the forum at [1]. The FTDI driver gives each half of the FTDI chip a seperate USB handle and USB endpoint, so they are essentially independent. The FTDI supplied software is the software that is needed to get this support; there is no TI specific software needed for this support.

Q: I see both 14 pin and 20 pin compact TI headers. Do I need both?

- A: Both are in the reference schematic for testing Code Composer Studio support. In the TI prototypes, we populate just one of the 2 headers. This allows use to test the extended capability available with the 20 pin connection. Please use the header that is needed for your target card.

XDS100v1 (Legacy)

Q: Where can I get the schematic for the XDS100v1?

- A: It is available from here (registration required).
- A: The C2000 control card schematics implement an XDS100 design optimized for C28x processors. The design is available as part of their baseline SW packages. These can be downloaded here

Q: What should the USB device's UID be?

- A: The EEPROM needs to be programmed for a VID=0403 PID=A6D0. The device name string should be, "Texas Instruments Inc. XDS100 Version 1.0".

Q: Ok, I built an XDS100, but how do I program the EEPROM for manufacturing?

- A: FTDI has a utility for this called MProg. See <u>here</u>.

Frequently Asked Questions (FAQ)

General FAQ

Q: Where can I find out more about Emulators which are compatible with TI devices?

- A: A general overview of TI emulation capabilities is <u>here</u>. For additional performance and capabilities, you may wish to review the <u>XDS510</u> and <u>XDS560</u> product lines which support TI devices.

Q: I would like to purchase a faster emulator, which one is recommended?

- A: TMS320C28x: The Spectrum Digital C2000 XDS510LC JTAG emulator is available, details may be found <u>here</u>. The Blackhawk C2000 USB controller (TI part #TMDSEMU2000U) is available from TI <u>here</u>.
- A: TMS320C674x: The Blackhawk <u>XDS560</u> (TI part #TMDSEMU560U for USB and TI part #TMDSEMU560PCI for PCI) are available from TI <u>here</u>. The Spectrum Digital <u>XDS510</u> (TI part #TMDSEMU510U for USB) is available from TI <u>here</u>.

Q: On the c28x, C674x, and C64x+ processor, does the XDS100 support <u>Real-Time Mode</u>?

- A: Yes. Learn more about <u>Real-Time Mode</u>.

Q: How to maximize performance of XDS100 under CCS?

A: A couple of things can be done to improve performance under CCS. Generally, the goal is to minimze the amount of information transferred for every action

- Make the disassembly window smaller or close the disassembly window. Stepping and general performance are better in the "C" language environment if the disassembly window is closed.
- Minimize the number of registers shown.
- Minimize the number of watch windows/variable windows.
- Turn off mixed C/disassembly mode.

Q: Does the XDS100 support debugging the C672x processor?

- A: No.

Q: Does the XDS100 support debugging the C24x processor?

- A: No.

Q: Does DSP/BIOS Real Time Analysis with RTDX work?

- Q: When using DSP/BIOS and the Real Time Analysis setup for RTDX, I get the cpu graph and real time logs updating. Does this mean RTDX is working/supported on the XDS100?
- A: RTDX is not supported on the XDS100. Please see the seciton <u>What features does the XDS100 NOT support</u>

Q: Can I use <u>Advanced Event Triggering</u> with XDS100?

- A: Yes.

Q: Can I plug more than one XDS100 (multiple XDS100) into a PC?

- A: With CCS v4 (with the XDS100v2 SW) and above you can plug more than one XDS100 on a single PC. This is not supported with CCSv3.3.
- Each XDS100 must have a unique serial number. Run xds100serial.exe installed under CCSv4 "<install_dir>/ccsv4/common/uscif/utility" as part of SW Patch to get the serial number of each connected XDS100 emulator. Under CCSv4 Target Configuration, the corresponding serial number

must be entered before launching target configuration.
- With older versions of CCS (ex: CCS v3.3), there is a known issue (see above) which prevents the CCS XDS100 driver from seeing more than one XDS100 in a system. If more than one is in a system, only the first one is recognized.
- Each unit needs a unique serial number. This can be read/set through the FTDI MPROG program. That unique serial number must be put into emulator setup in CCSv4. There is a program called xds100serial.exe in the CCSv4 <install_dir>\ccsv4\common\uscif\ftdi\utility directory. This program displays the serial numbers for all the currently connected XDS100(s).

Q: Can I use the XDS100 with Stellaris Cortex M3 devices?

A: No. Stellaris is not supported with CCS v4.1. You may also want to look at: TI tools support for Cortex M3

Q: Can I use the XDS100v2 as JTAG simultaneously with the second port being a serial port (UART)?

- A: Please check for additional details in the XDS100v2 hardware design section. See XDS100#Q:_Can_I_use_port_B_as_a_UART.3F.

Q: How can I turn on adaptive clocking?

- A: You need to select the Adaptive Clocking option in the setup box (CCS v4.x).
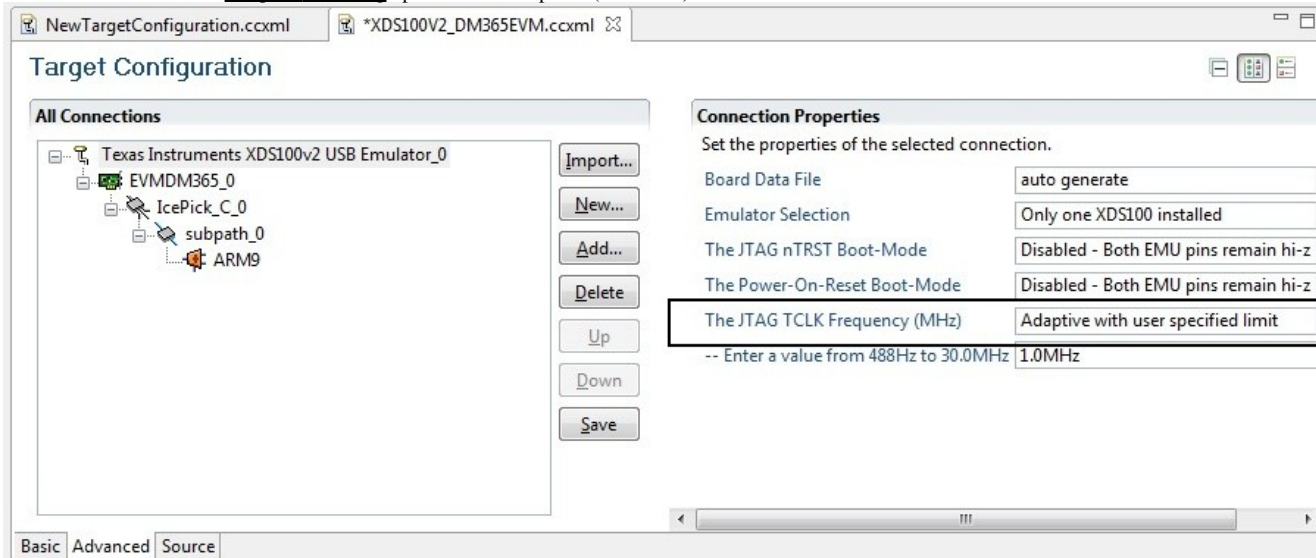
- You can change the timeouts from the target as well. This is helpful if you get many timeout messages.
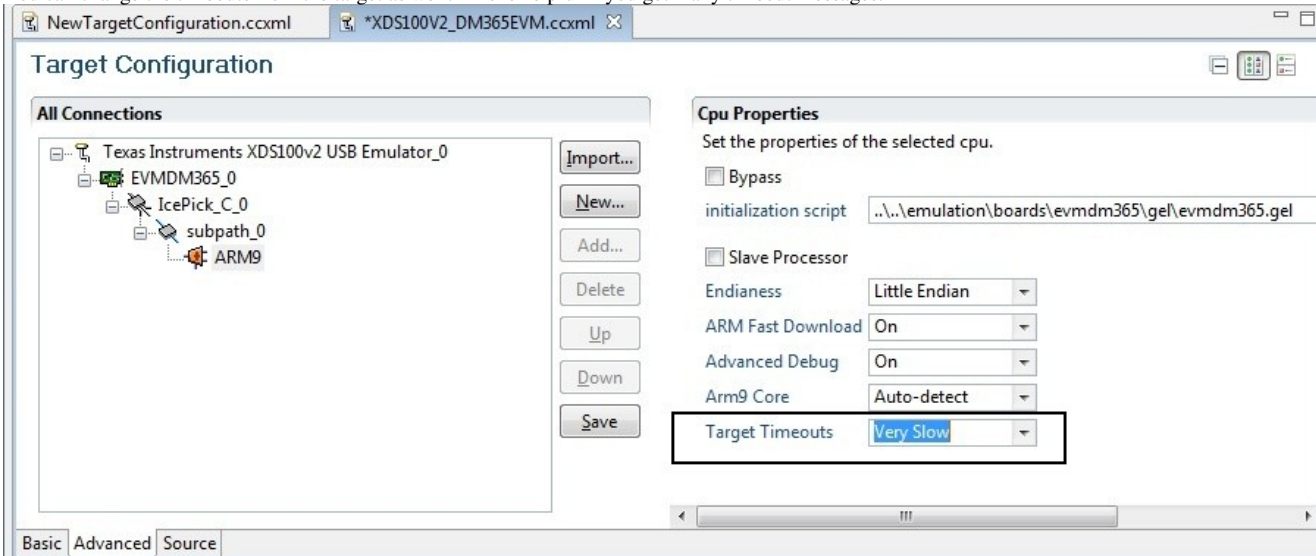
Q: Can I plug more than one XDS100 (multiple XDS100) into a PC?   8

Q: My XDS100v2 does not work reliabily with the DM365 / ARM926 core.

- A: This can be caused by a variety of issues such as where the PLL is programmed to the use of <u>Adaptive Clocking</u> emulator. Usually, it is seen as a problem around the PLL setup. This is because the core PLL clock is changing. Example error message:

```
ARM9: GEL Output: Setup PLL0...
```

ARM9: Trouble Writing Memory Block at 0x1c40900 on Page 0 of Length 0x4: 0x00000004/-2030 @ marker 1026 Error during: Register, Access to an unknown or invalid register was attempted.

ARM9: GEL: Error while executing OnTargetConnect(): target access failed.

A couple of things to try:

1. Setup the PLL by executing code (ex: UBoot, etc.) instead of using the GEL file. (preferred)
2. Turn on adaptive clocking [XDS100#Q:_How_can_I_turn_on_adaptive_clocking.3F] and setup the timeouts to very slow. In this mode, it is still better to "run" the code and not "step" it.

Q: Can I use the XDS100 with OMAP-L138/C6748 EVM board?

- A: See <u>How to connect to the OMAP-L138/C6748 EVM board using CCS?</u>

Installation FAQ

Q: Where are the drivers for the hardware? Windows is asking for the drivers.

- A: Please see Installation instructions

Q: What operating systems are supported?

- A: Please see <u>System Requirements</u> for Operating System support for CCS.

Q: I do not see my F28x Piccolo device listed in the CCS setup menu.

- A: You have an older version of the XDS100 SW/CCS. The F28x Piccolo device configuration files are included in the latest versions of the SW. Please see the installation notes above.

Q: What does the windows messages look like in Windows XP upon successful installation?

- A: See <u>here</u>. Note that after the first installation, there are no subsequent messages in Windows XP from the USB driver.

Q: I am using CCSv3.3 today. Can I get a driver to support XDS100 for my processor?

A: All new XDS100 development is being done on <u>Code Composer Studio v4</u>. Existing processors supported by XDS100 in CCSv3.3 will continue to be supported, but newer processors will not be added.

Q: Can I use <u>Code Composer Studio v4</u> with XDS100?

A: There is a free license for <u>Code Composer Studio v4</u> when used with XDS100. Code Composer Studio v4 can be downloaded from the <u>Code Composer Studio v4</u> page. When you install CCS, you need to select the correct license. See below on how to select the correct license. This license is designed to be use with XDS100 only, and not <u>XDS510</u> or <u>XDS560</u> emulators. Please see <u>Activating_CCS#Generate_and_Install_a_License_File</u> for details.
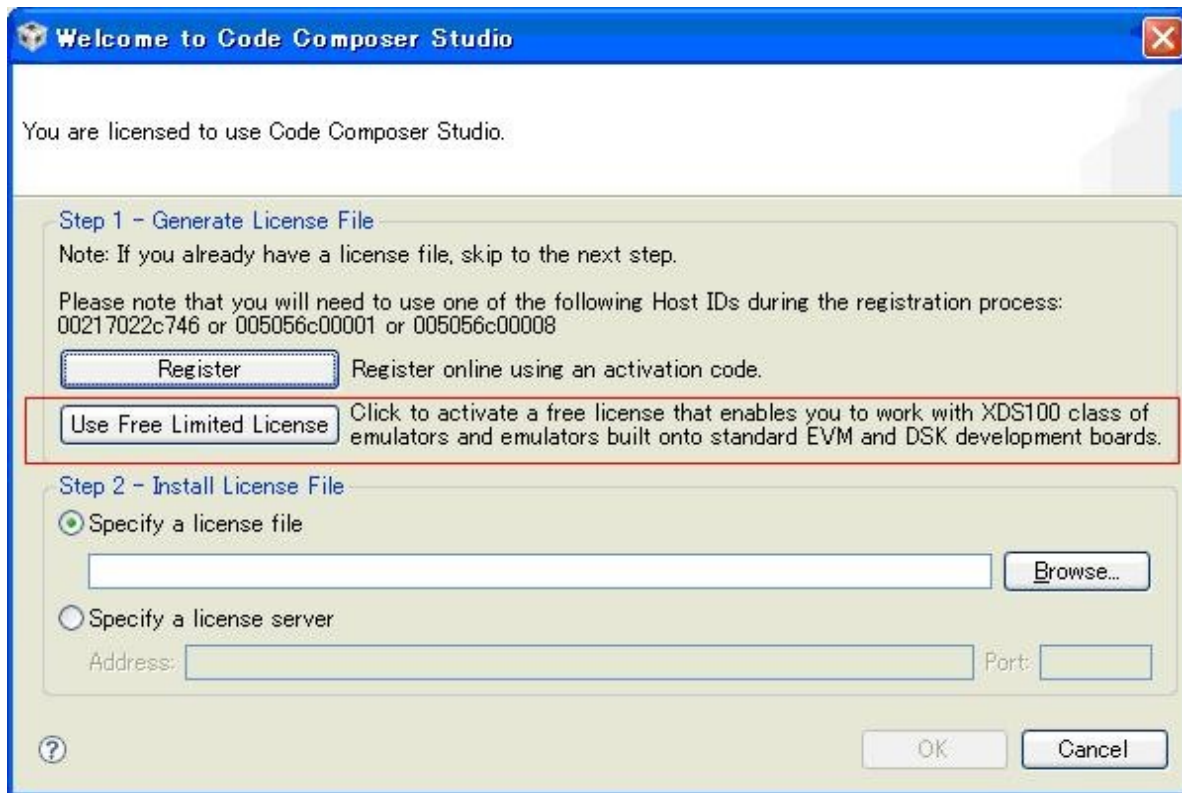
Troubleshooting FAQ

Q: Why is the download frozen?

- A: While loading a large program or program section, the file load status bar may appear frozen when it is not frozen. The status bar is showing section load start and completion.

Q: Windows is recognizing the XDS100 as "Dual RS232 USB Serial Bridge" instead of the TI XDS100 JTAG emulator.

- Q: I have a C2000 Experimenter kits/Piccolo USB Stick that includes the onboard USB JTAG emulation, but the onboard USB JTAG emulation is being recognized by Windows as "Dual RS232 USB Serial Bridge" instead of the TI XDS100 JTAG emulator.

- A: See this post on the forums.

Q: I used the FTClean utility on my computer and now I can't connect to the XDS100! What can I do?

- A: Running FTClean will remove the windows FTDI drivers for the XDS100. The TI XDS100 FTDI drivers were installed with the CCS installation or service patch. The XDS100 drivers are signed for the VID/PID combination. To recover, please re-install the CCS version/path you were last using before running FTClean which included the TI signed XDS100 drivers.

Q: My XDS560 stopped working when I installed the XDS100...

- A: Note that the XDS100 software is included and installed with CCS v3.3 SR12 or newer and/or CCSv4. For CCS v3.3 and SR12, it is recommended that users install the new Blackhawk XDS560 driver from Blackhawk website. There is no need to install a new Blackhawk driver with CCS v4.

Q: My JTAG is not working with CCS...

A: Please check: Debugging JTAG Connectivity Problems

Q: Can I use Code Composer Studio v4 with XDS100?   10

XDS100

Q: I see in my Windows Device Manager an error for a TI <u>XDS560</u> emulator.

A: The XDS100 will not be affected by this. Please see
<u>XDS560#Q:_Why_does_my_Windows_Device_Manager_show_a_warning_for_the_TI_XDS560_PCI_Emulator.3F</u>

Q: I see a Windows device manager problem with Texas Instruments XDS560 PCI JTAG emualtor. Does this affect the XDS100?

A: No. This error is caused by the Texas Instruments XDS560 PCI JTAG emulator not being installed. This service may be used by other <u>XDS560</u> emulators. A proper setup in Windows device manager will look like the image in <u>XDS100#Troubleshooting</u>.

Q: Can I use an XDS100v2 hardware with a older version of Code Composer Studio? (Ex: CCS v3.3)

- A: No. The XDS100v2 will not work with older versions of Code Composer Studio that do not support the XDS100v2. Code Composer Studio v3.3 is not supported by the XDS100v2 hardware. For Code Composer Studio v4 users, please upgrade to the latest software versions as listed in the software installation section. If you use a XDS100v2 hardware unit with a version of CCS which does not support it, the software will just see a zero-bit scan chain. If you use <u>DBGJTAG</u> to test the JTAG scan path, it will look like the below, with a zero-bit scan path on both IR and DR.

```
C:\ccsv4\ccsv4\common\uscif>dbgjtag -f "C:\ccsv4\ccsv4\DebugServer\bin\win32\BrdDat\ccBoard0.dat" -rv -S pathlength
-----[Print the reset-command software log-file]----------------------------

This utility will use the original port address '0'.
The controller does not use a programmable FPGA.
The emulator adapter uses the JIO interface.
The emulator adapter is named 'jioserdesusb.dll'.
The emulator adapter is version '35.34.0.7'.
The controller has a version number of '4' (0x00000004).
The controller has an insertion length of '0' (0x00000000).
This utility will now attempt to reset the controller.
This utility has successfully reset the controller.

-----[Print the reset-command hardware log-file]----------------------------

The scan-path will be reset by toggling the JTAG TRST signal.
The controller is the FTDI FT2232 with USB interface.
The link from controller to target is direct (without cable).
The software is configured for FTDI FT2232 features.
The controller cannot monitor the value on the EMU[0] pin.
The controller cannot monitor the value on the EMU[1] pin.
The controller cannot control the timing on output pins.
The controller cannot control the timing on input pins.
The scan-path link-delay has been set to exactly '0' (0x0000).
This utility will use the original port address '0'.
The emulator adapter uses the JIO interface.
The emulator adapter is named 'jioserdesusb.dll'.
The emulator adapter is version '35.34.0.7'.
The controller has a version number of '4' (0x00000004).
The controller has an insertion length of '0' (0x00000000).
The local memory has a word capacity of '1048576' (0x00100000).

-----[Perform the standard path-length test on the JTAG IR and DR]-----------

This path-length test uses blocks of 512 32-bit words.

The test for the JTAG IR instruction path-length succeeded.
The JTAG IR instruction path-length is 0 bits.

The test for the JTAG DR bypass path-length succeeded.
The JTAG DR bypass path-length is 0 bits.
```

Q: On connecting the USB, I get the error message "The file FTDIBUS.SYS on FTDI USB Drivers Disk is needed"

- A: The USB drivers are likely missing. Please see the installation instructions above to install the software before trying to connect the XDS100.
- A: It may also be that the FTDI EEPROM is not properly progrmmed. Please contact your XDS100 vendor to have the problem corrected. You could also see the section on <u>Xds100#How_to_make_an_XDS100</u> to program the EEPROM.

Q: I got a -150 SC_ERR_POD_FAIL error, what does this mean?

- For an XDS100, this means that Code Composer Studio is having a problem talking to the XDS100. The problem is with the communication between the adapter and the FTDI chip. Either the FTDI driver has returned an error, or the chip failed to return the expected number of bytes to Code Composer Studio. In practice, this has usually been found to be a problem with the FTDI drivers. Either the wrong drivers were installed, or there is a conflict with FTDI drivers used for another device, or a software process that hasn't completely terminated and is holding the device open. In the case where a software process hasn't terminated, it may be that Code Composer Studio may not have terminated properly. Check the Windows Task Manager that Code Composer Studio related processes are terminated prior to re-starting.

Hardware FAQ

Q: Where can I find out about pinout of JTAG connectors?

- A: Please check the page on <u>JTAG Connectors</u>.

Q: What if I need electrical isolation?

- A: If you are working with a target which has high voltages, you may want to use an isolation adapter. There is an isolation adapter available <u>here</u>

Q: What device voltages are supported by the XDS100v1?

- A: The XDS100v1 reference design supports 1.8V and 3.3V targets. The SN74CBT3125 (U3) and SN74LVC2T45 (U5) perform the voltage buffering. The MCP6041 (IC5) and TLC393 (IC1B) are used for voltage sensing. The 74HC74(IC3A) and TLC393 (IC1A) form the power detect circuit by reaching the TVO pin.

Q: I work with high voltages, where can I get an isolation adapter?

- A: TI offers an isolation adapter (TI part #: TMDSADP1414-ISO) <u>here</u>.

Q: Can I change the serial number on my XDS100v2?

- A: Yes, using the FTDI MProg utility and one of the configurations in <u>Media:xds100v2serial.zip</u> so you can change the serial number of an XDS100v2 product if desired.
- If you plan to use 1 or more XDS100v2 emulators in CCSv4 simultaneously then each XDS100v2 must have a unique serial number.
- For ease of use Spectrum Digital generally programs the XDS100v2 with a fixed serial number as this is the most common use case and is consistent with other low cost Spectrum Digital products.

```
Steps:
1) Launch MProg.
2) Load the desired configuration.
     For Fixed Serial Number:        File->Open SDXDS100v2_FIXED.EPT
     For Autogenerated Serial Number: File->Open SDXDS100v2.EPT
3) Enable programming of pre-programmed devices if needed.
       File->Edit and uncheck "Only Program Blank Devices"
4) Program the ROM
     Device->Program
```

Q: What frequencies are supported by XDS100v2? Can I change it?

- A: The default frequency is 1Mhz. Other frequencies can be selected, but they are not supported.

Q: On XDS100v1 design, what does the OE signal do? (pin 12 of FTDI)

- A: On the XDS100v1 design, this OE signal on pin 12 of the FTDI chip comes from the ICA3A device (74HC74, flip flop). The ICA3A/IC1A section of the circuit samples the TVD signal to detect whether there is target power. This signal is read by the debugger via the GPIO on the FTDI. This signal has an opposite signal /OE which goes to U3. U3 provides a buffer which performs the voltage translation.

Older Versions

<u>XDS100 v1.0 RTM SW</u>: It is recommended that users upgrade to the latest versions of the XDS100 SW. <u>Please check the Software section above.</u> <u>Do NOT install</u> this if you are using CCS v3.3 SR12 or newer, a CCS which came with your C2000 Control Stick, or CCSv4.