Stellaris® In-Circuit Debug Interface (ICDI) and Virtual COM Port

Tiva™ C Series evaluation and reference design kits provide an integrated Stellaris In-Circuit Debug Interface (ICDI) which allows programming and debugging of the onboard LM4F microcontroller. The Stellaris ICDI can be used with the Stellaris LM Flash Programmer as well as any of the Tiva C Series-supported toolchains such as Texas Instruments' Code Composer Studio. Only JTAG is supported. This document presents the instructions for installing the appropriate drivers on the host computer.

1 Stellaris ICDI Drivers

To debug and download the custom application in the microcontroller's Flash memory and use Virtual COM Port connectivity, install the following drivers on the host computer:

- Stellaris Virtual Serial Port
- Stellaris ICDI JTAG/SWD Interface
- Stellaris ICDI DFU

NOTE: The host PC should be running the Microsoft Windows® 2000, Windows XP, Windows 7, or Windows 8 operating systems (OSs). This document describes how to install drivers on the Windows XP OS (see the Driver Installation Using Windows XP section) as well as the Windows 7 and Windows 8 OSs (see the Driver Installation Using Windows 7 or Windows 8 section).

These drivers provide the debugger with access to the JTAG interface and the host PC with access to the Virtual COM Port.

1.1 Validate Installed Drivers

To see which drivers are currently installed on the host computer, check the system hardware properties using the Windows Device Manager.

Windows XP or Windows 7

To perform this action on Windows XP or Windows 7, follow these steps (see next section for Windows 8 instructions):

1. Right-click the *My Computer* (Windows XP) or *Computer* (Windows 7) menu item from the Windows **Start** button; select *Manage* from the drop-down menu.

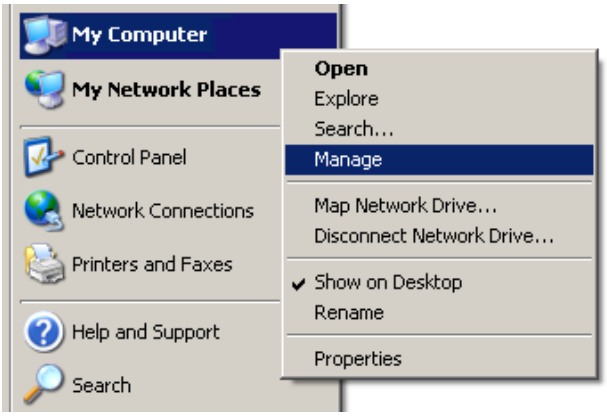

Figure 1. Windows XP

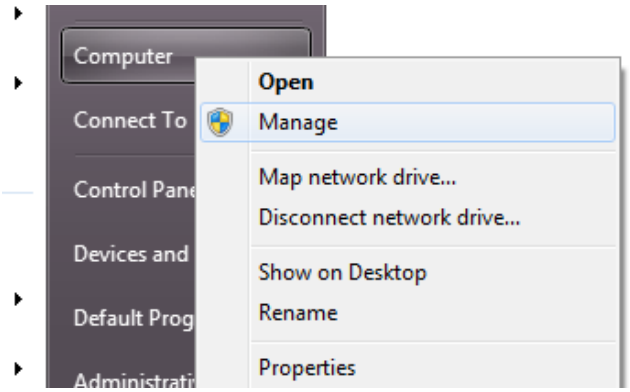

Figure 2. Windows 7

2. Click *Device Manager* under Computer Management→System Tools. The Device Manager window displays a list of hardware devices installed on your computer and allows the properties to be set for each device.

Figure 3. Windows XP

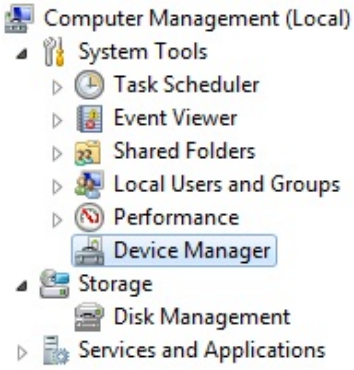

Figure 4. Windows 7

Windows 8

To check the hardware properties using the Windows Device Manager on Windows 8, follow these steps (see previous section for Windows XP or Windows 7 instructions):

1. Open the Windows Start Screen and click *Computer Management*.

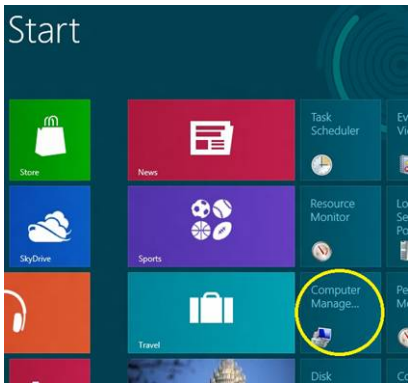

Figure 5. Windows 8

2. Click *Device Manager* under Computer Management→System Tools (refer to Figure 3). The Device Manager window displays a list of hardware devices installed on your computer and allows the properties to be set for each device.

1.2 Update Drivers

When the board is connected to the computer for the first time, the computer detects the onboard ICDI interface and the Tiva C Series microcontroller. Drivers that are not yet installed display a yellow exclamation mark in the Device Manager window.

Figure 6.

Download the necessary drivers for your Tiva evaluation or reference design kit from the Stellaris ICDI Drivers tool folder on the TI website. Extract the files from the compressed folder to a known location on your Windows-enabled host PC.

Using the included USB cable, connect the Tiva board to your host PC as specified by the *README First* document for the respective kit.

2 Driver Installation Using Windows XP

Follow these directions to install the drivers on a host PC that is running Windows XP.

When the Tiva board is connected to the host PC for the first time, Windows starts the *Found New Hardware* Wizard and prompts to install the drivers for the Stellaris Virtual Serial Port. Select *Install from a list or specific location (Advanced)* and then click Next.

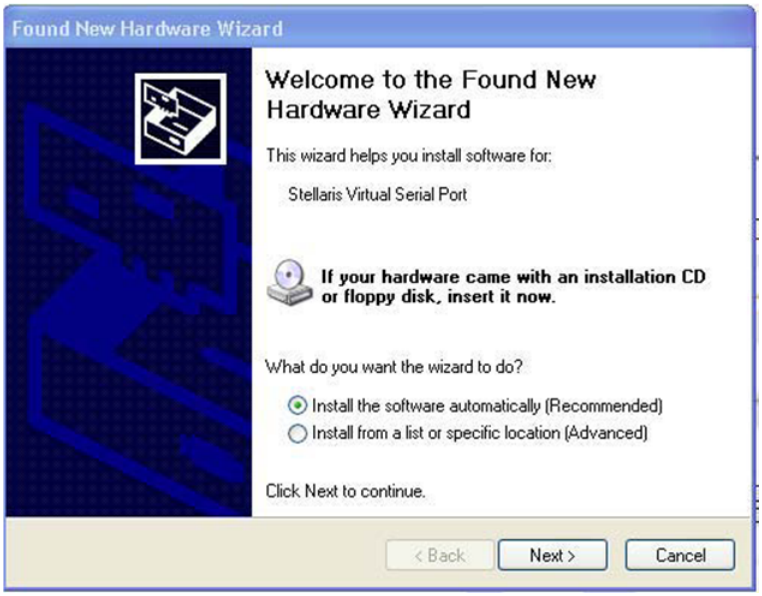

Figure 7.

Select *Search for the best driver in these locations*, and check the *Include this location in the search* option. Click Browse. Browse to the known location on your host PC of the driver installation files. Click OK, then click Next.

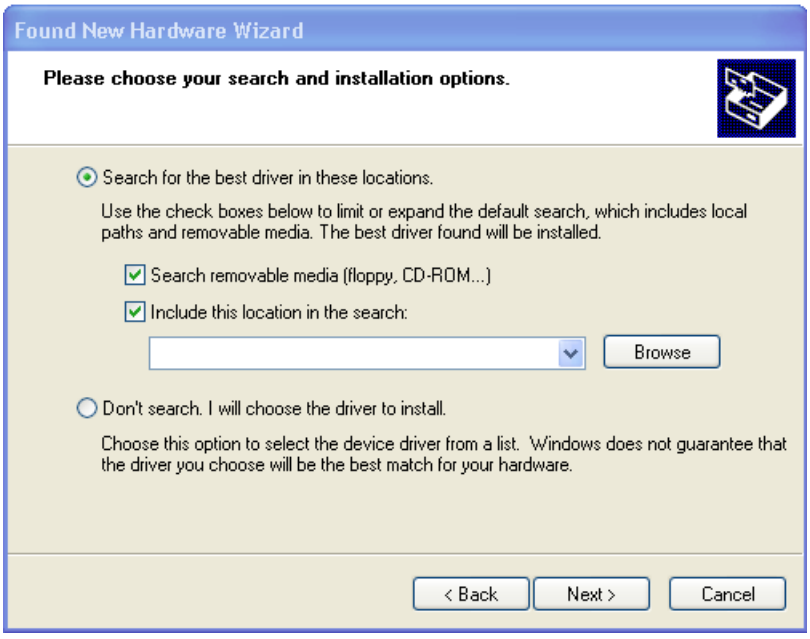

Figure 8.

A warning may appear during the installation process to caution that the driver is not signed; click Continue Anyway to proceed. The wizard displays a *Please wait while the wizard searches…* status window. No user action is required at this point.

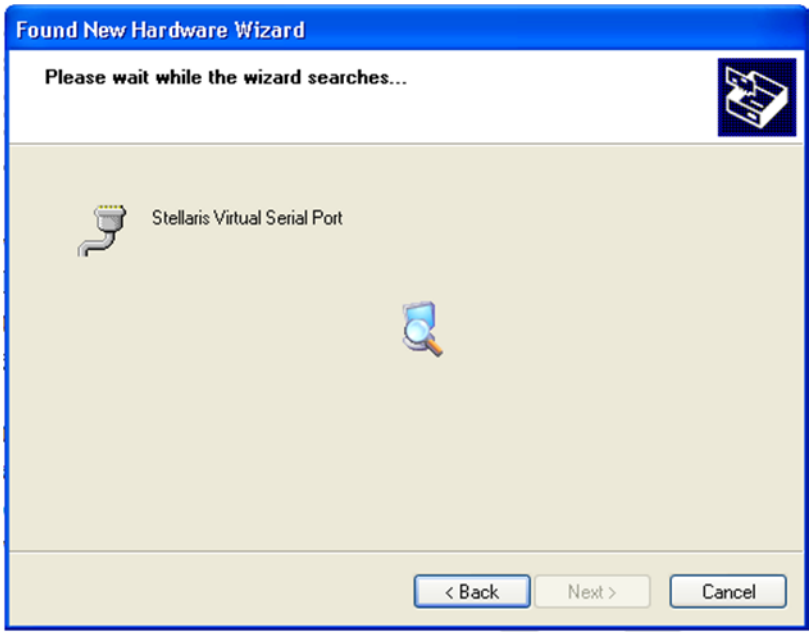

Figure 9.

The wizard then displays a *Please wait while the wizard installs the software…* status window as the software is installed.

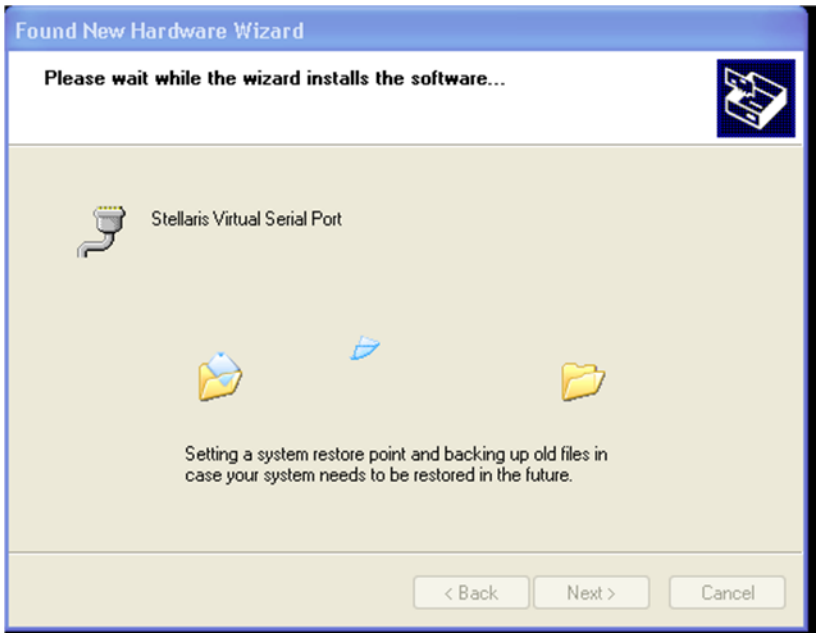

Figure 10.

After the installation of the Stellaris Virtual Serial Port drivers completes, click Finish to close the dialog box.

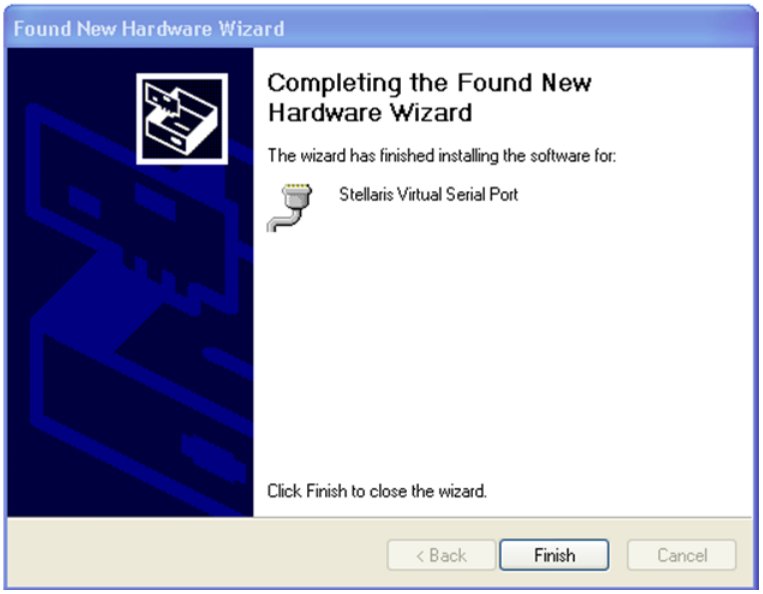

Figure 11.

The drivers for the Stellaris Virtual Serial Port have now been installed.

The *Found New Hardware* Wizard appears a second time for the Stellaris ICDI JTAG/SWD Interface, and then one more time for the Stellaris ICDI DFU Device drivers. Follow the same instructions to install the drivers for these two devices.

Confirmation that these device driver installed correctly can be found by launching the Windows Device Manager and right-clicking to select *Scan for Hardware Changes*. This scan updates the Device Manager properties list. Most of the time, the Device Manager refreshes the properties list automatically. The Stellaris Virtual Serial Port, the Stellaris ICDI JTAG/SWD Interface, and the Stellaris ICDI DFU Device should now appear in the list. This action indicates that the drivers have been successfully installed.

When these drivers are properly installed, Windows automatically detects any new Tiva boards (with a Stellaris-based ICDI) that are connected to the computer, and installs the required drivers.

3 Driver Installation Using Windows 7 or Windows 8

Follow these directions to install the drivers on a host PC that is running Windows 7 or Windows 8.

When the Tiva board is connected for the first time, the Windows 7 or Windows 8 system immediately searches for signed drivers. Wait until this process times out. The following screen appears:

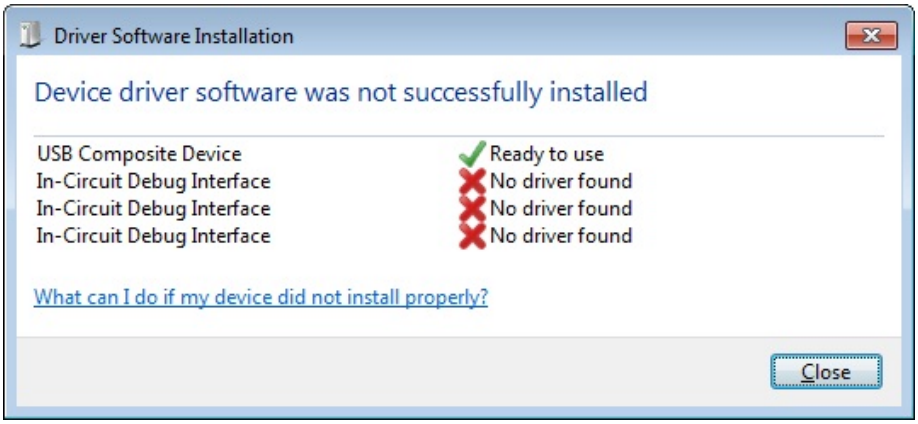

Figure 12.

Open the Windows Device Manager. Under the category *Other devices*, you should see three In-Circuit Debug Interface devices with yellow exclamation marks.

Figure 13.

Right-click one of these device entries and select *Update Driver Software*.

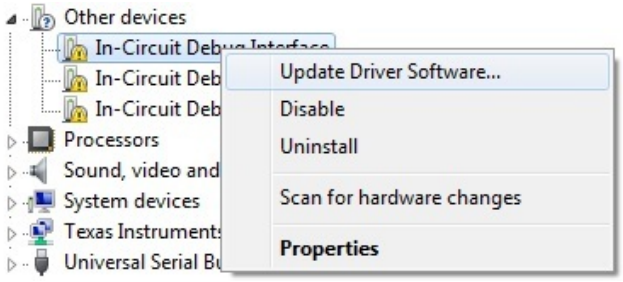

Figure 14.

A Windows prompt asks: *How do you want to search for driver software?* Select *Browse my computer for driver software*.

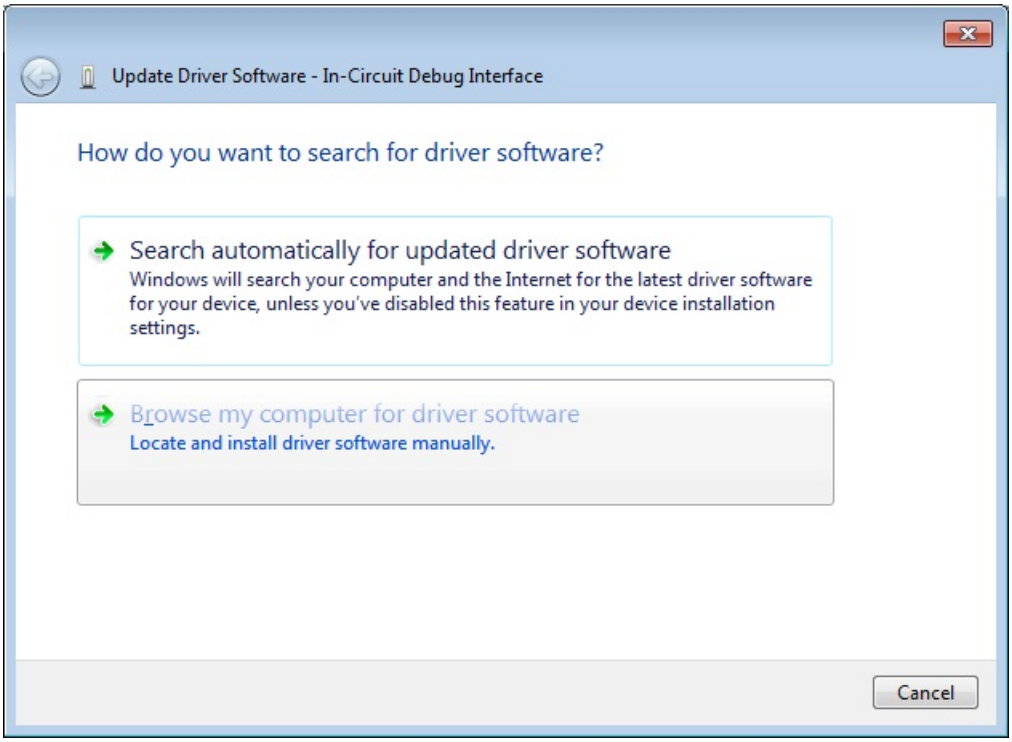

Figure 15.

Under *Search for driver software in this location*, click Browse. Browse to the known location on your host PC of the driver installation files. Click OK. Check the *Include subfolders* option, and then click Next.

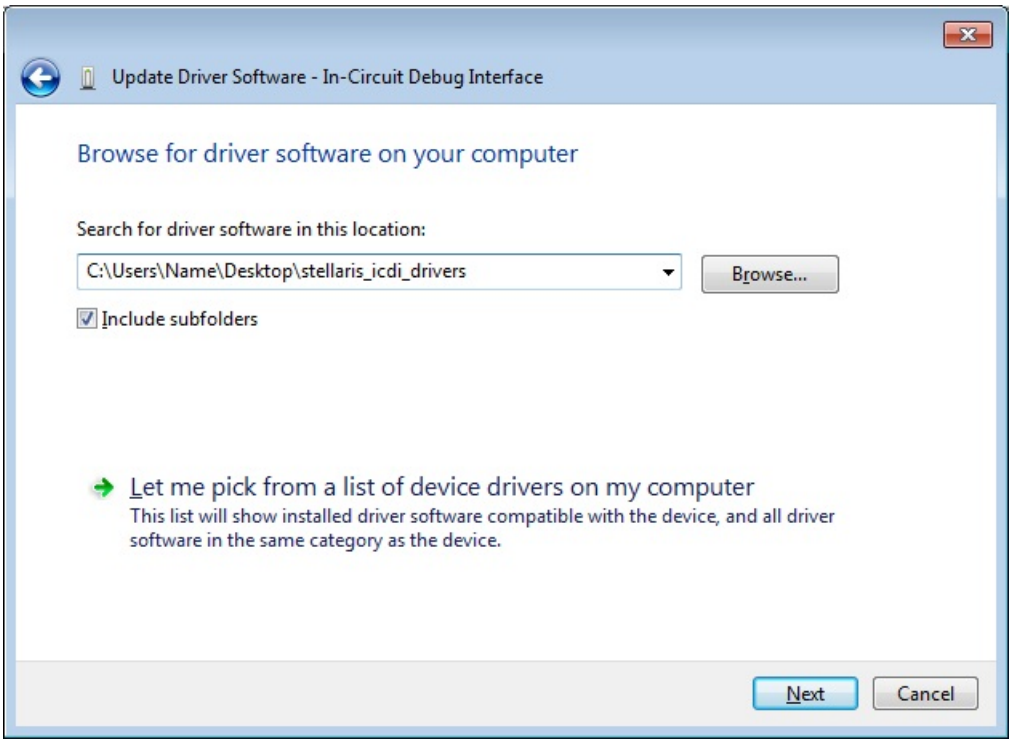

Figure 16.

Windows now displays a status window that shows where it is currently searching for the drivers. No user action is required at this point.

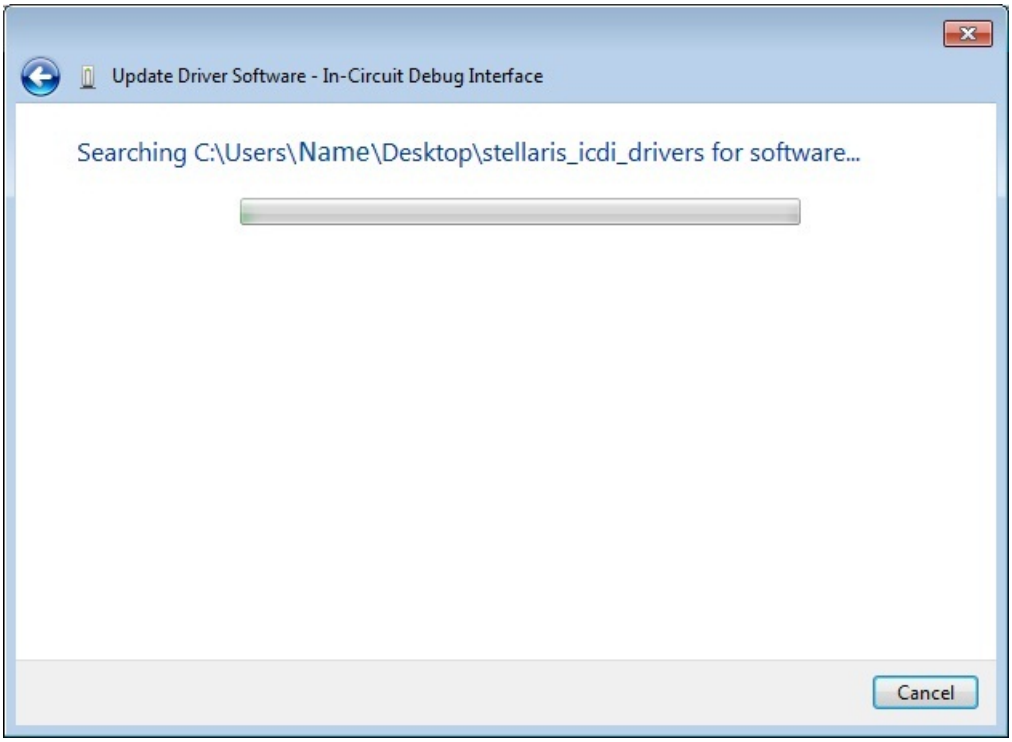

Figure 17.

The system then displays an *Installing driver software…* status window; this message indicates that the drivers were found in the specified location, and that they are being installed.

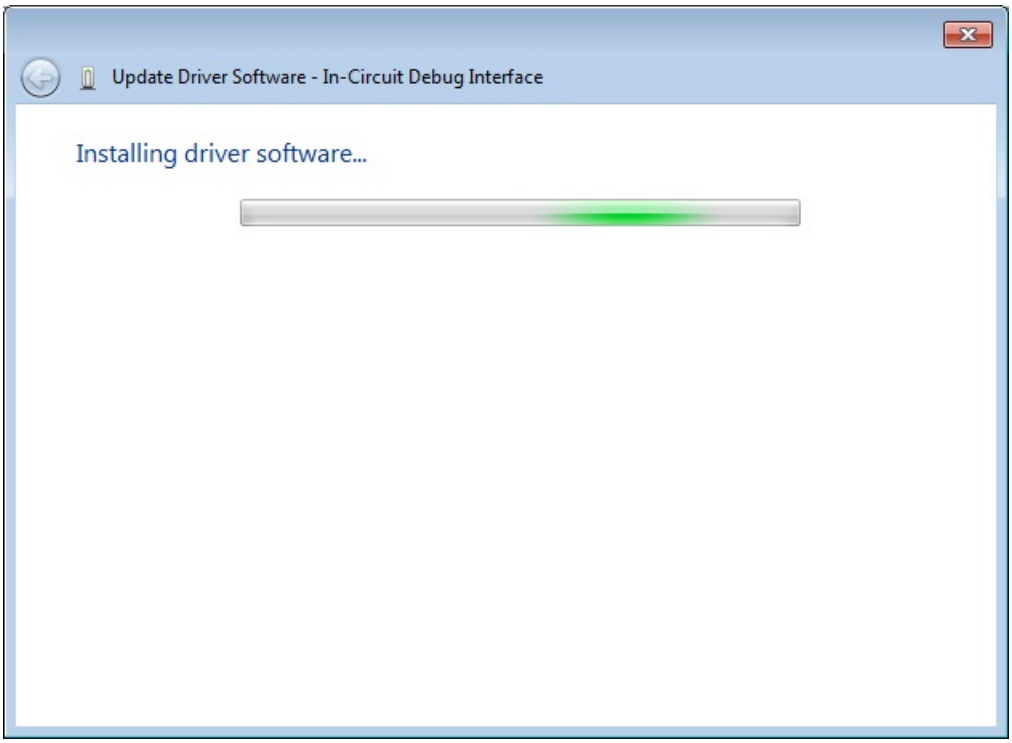

Figure 18.

A warning may appear that says *Windows can't verify the publisher of this driver software*. This message appears because the driver is not signed. Click *Install this driver software anyway* to proceed.

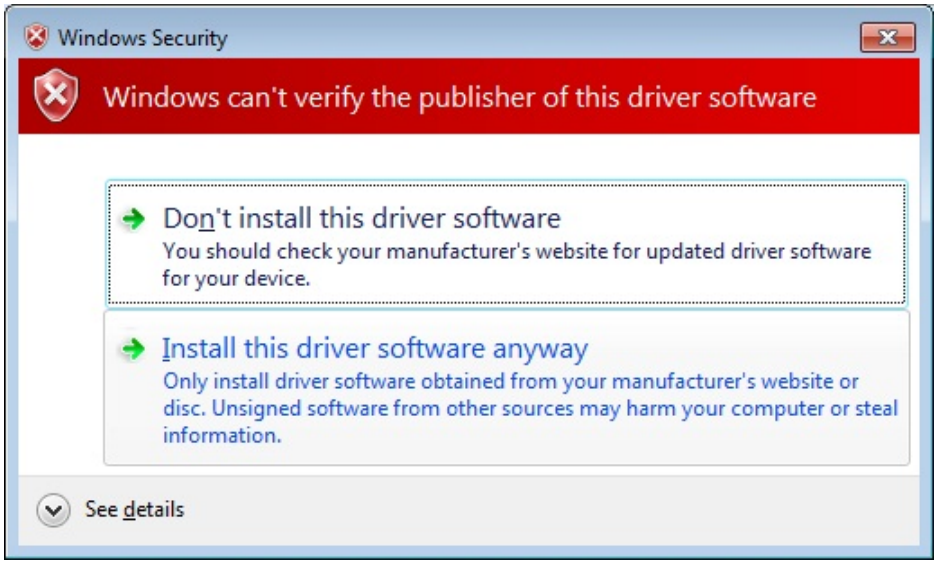

Figure 19.

When the installation is complete, Windows displays a message that says *Windows has successfully updated your driver software*. On the same message window, one of these three devices should be listed:

- Stellaris Virtual Serial Port
- Stellaris ICDI DFU Device
- Stellaris ICDI JTAG/SWD Interface

For example, Figure 20 shows when the driver for the Stellaris Virtual Serial Port has been successfully installed. Click Close to close the dialog box.

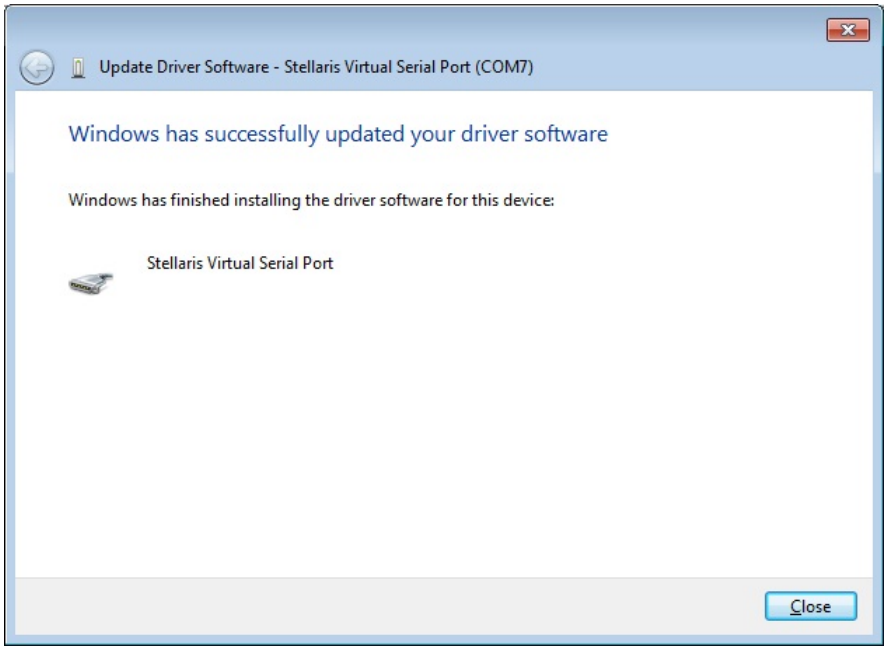

Figure 20.

Confirmation these device drivers installed correctly can be found by launching the Windows Device Manager and right-clicking to select *Scan for Hardware Changes*. This scan updates the Device Manager properties list. Most of the time, the Device Manager refreshes the properties list automatically. This action indicates that the drivers have been successfully installed. You should either see the Stellaris Virtual Serial Port under the *Ports* category (COM and LPT), or else the Stellaris ICDI DFU Device or the Stellaris ICDI JTAG/SWD Interface under the *Stellaris In-Circuit Debug Interface* category.

Repeat the same process to install the drivers for the remaining two devices.

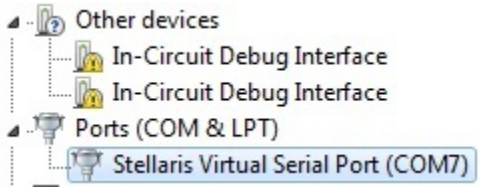

Figure 21.

After all three device drivers have been successfully installed, the Stellaris Virtual Serial Port should appear under the *Ports* (COM and LPT) category and both the Stellaris ICDI DFU Device and the Stellaris ICDI JTAG/SWD Interface under the *Stellaris In-Circuit Debug Interface* category. If installed correctly, none of the drivers shows a yellow exclamation mark.

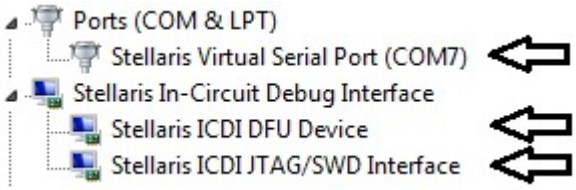

Figure 22.

4 Conclusion

You are now ready to program your Tiva device with the LM Flash Programmer or any of the Tiva C Series-supported toolchains.

5 References

In addition to this document, the following references are available for download at www.ti.com/tiva-c (click the *Technical Documents* tab):

- Tiva C Series Development and Evaluation Kits for Code Composer Studio™ Quickstart Guide (SPMU132).
- Tiva C Series Development and Evaluation Kits for Keil™ Quickstart Guide (SPMU355).
- Tiva C Series Development and Evaluation Kits for IAR Quickstart Guide (SPMU354).
- Tiva C Series Development and Evaluation Kits for CodeBench™ Quickstart Guide (SPMU356).
- Tiva C Series Microcontroller Data Sheet (individual device documents available through product selection tool).
- Tiva C Series Evaluation or Reference Design Kit User's Manual (individual kit documents available)
- Tiva C Series Evaluation Kit README First (individual kit documents available)
- TivaWare for C Series Driver Library. Available for download at www.ti.com/tool/sw-tm4c-drl.
- TivaWare for C Series Driver Library User's Manual, publication SW-DRL-UG (SPMU928).

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Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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This Class A or B digital apparatus complies with Canadian ICES-003.

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Concerning EVMs including radio transmitters

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concerning EVMs including detachable antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet appareil numérique de la classe A ou B est conforme à la norme NMB-003 du Canada.

Les changements ou les modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner l'équipement.

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Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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1. Use this product in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use this product only after you obtained the license of Test Radio Station as provided in Radio Law of Japan with respect to this product, or
3. Use of this product only after you obtained the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to this product. Also, please do not transfer this product, unless you give the same notice above to the transferee. Please note that if you could not follow the instructions above, you will be subject to penalties of Radio Law of Japan.

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3. Since the EVM is not a completed product, it may not meet all applicable regulatory and safety compliance standards (such as UL, CSA, VDE, CE, RoHS and WEEE) which may normally be associated with similar items. You assume full responsibility to determine and/or assure compliance with any such standards and related certifications as may be applicable. You will employ reasonable safeguards to ensure that your use of the EVM will not result in any property damage, injury or death, even if the EVM should fail to perform as described or expected.
4. You will take care of proper disposal and recycling of the EVM's electronic components and packing materials.

Certain Instructions. It is important to operate this EVM within TI's recommended specifications and environmental considerations per the user guidelines. Exceeding the specified EVM ratings (including but not limited to input and output voltage, current, power, and environmental ranges) may cause property damage, personal injury or death. If there are questions concerning these ratings please contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, some circuit components may have case temperatures greater than 60°C as long as the input and output are maintained at a normal ambient operating temperature. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors which can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during normal operation, please be aware that these devices may be very warm to the touch. As with all electronic evaluation tools, only qualified personnel knowledgeable in electronic measurement and diagnostics normally found in development environments should use these EVMs.

Agreement to Defend, Indemnify and Hold Harmless. You agree to defend, indemnify and hold TI, its licensors and their representatives harmless from and against any and all claims, damages, losses, expenses, costs and liabilities (collectively, "Claims") arising out of or in connection with any use of the EVM that is not in accordance with the terms of the agreement. This obligation shall apply whether Claims arise under law of tort or contract or any other legal theory, and even if the EVM fails to perform as described or expected.

Safety-Critical or Life-Critical Applications. If you intend to evaluate the components for possible use in safety critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, such as devices which are classified as FDA Class III or similar classification, then you must specifically notify TI of such intent and enter into a separate Assurance and Indemnity Agreement.

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