![TEXAS INSTRUMENTS]

SigCon Architect: Installation and Starter's Guide

1   Introduction

SigCon Architect is a GUI software tool that allows users to evaluate various high speed signal conditioning products in TI's Datapath Solutions portfolio. Through MSP430 MCU communication, this software tool uses intuitive graphical profiles to highlight common features for each device. SigCon Architect also provides access to device-specific functions, such as EEPROM hex file generation, internal eye monitor viewing, and low-level register bit access. This document details instructions for successful software installation and GUI bring-up.

2   Installation Pre-Requisites and Installation Types

Please ensure that your PC meets the following criteria to use SigCon Architect properly:
- Operating System: Windows 7 (64-bit or 32-bit)
- Text Size: 100% (Recommended)

The SigCon Architect installers both include the following application requirements and will install silently if the PC does not already have them:
- USB2ANY v2.7.0.0 firmware or later
- Python 2.7 (for scripting utility. Later versions not yet supported)

In addition to the above application requirements, SigCon Architect requires LabVIEW Run-Time Engine (RTE) 2012 (or compatible). Users can choose between one of two SigCon Architect installer types. The difference depends on whether the PC already has LabVIEW RTE 2012 (or compatible) installed.

INSTALLER TYPE	DESCRIPTION
SigCon Architect Installer (SNLC054)	Size ~16 MB
	Run-Time Engine (RTE) Installer not embedded
	Recommended for users who already have LabVIEW RTE 2012 (or compatible) installed[1]
SigCon Architect Installer wRTE (SNLC055)	Size ~263 MB
	Run-Time Engine (RTE) Installer embedded
	Recommended for users who do not already have LabVIEW RTE 2012 (or compatible) installed

[1]   If users do not have LabVIEW RTE 2012 (or compatible) when running SigCon Architect Installer (SNLC054), the installer will redirect them to NI.com in order to obtain LabVIEW RTE 2012.

3 Installation and Uninstallation Instructions

3.1 Installation

1. Use your web browser to download the SigCon Architect Installer from TI.com. Select the appropriate installer based on Section 2.
   - SNLC054 -- Without LabVIEW RTE embedded
   - SNLC055 -- With LabVIEW RTE embedded
2. After selecting one of the installers, you will be prompted to sign into TI.com. Sign into TI.com, fill out the information for U.S Government Export Approval, and submit.
3. You will then be directed to a download page. Select "Download." The dialog box in Figure 1 should appear. Select "Open with Windows Explorer."
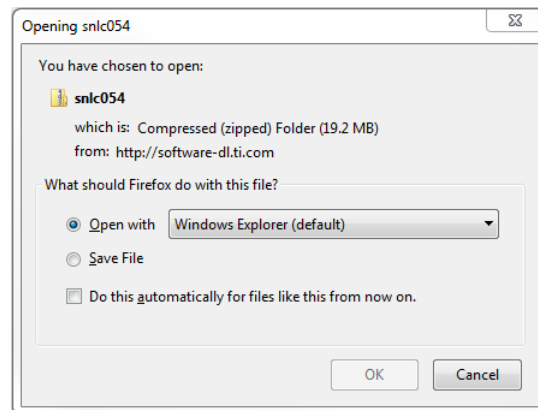

Figure 1. Dialog Box for Downloading the SigCon Architect Installer

4. Once the installer is downloaded, the folder containing the installer should appear in Windows Explorer. Extract the file folder and run the executable file.

   NOTE: You will be prompted to extract the folder if you run the .exe within the zip file.

5. Run the executable file. Skip to Step 6 if the following apply to you:
   - You are installing SNLC055 (LabVIEW RTE embedded)
   - You are installing SNLC054 (LabVIEW RTE not embedded) and already have LabVIEW RTE 2012 (or compatible) installed

   If you are installing SNLC054 and do **not** already have LabVIEW RTE 2012 (or compatible) installed previously, the message in Figure 2 will pop up when attempting to run the executable file.
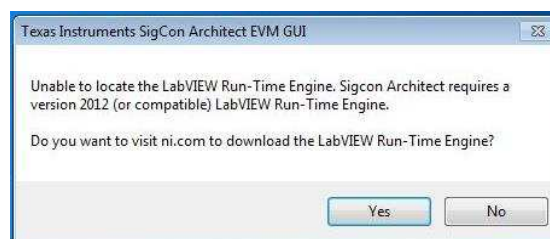

Figure 2. Pop-Up Message if LabVIEW RTE 2012 Undetected

   Click "Yes" to be redirected to NI.com to download LabVIEW RTE 2012. Follow the instructions on NI.com to install LabVIEW RTE 2012 properly.

   After running the LabVIEW RTE 2012 installer, a PC restart is necessary to complete LabVIEW RTE installation. After restarting the PC, navigate back to SNLC054 and run the executable again. The pop-up message should no longer appear.

6. When the executable runs, a setup wizard will appear as shown in Figure 3. Close any programs that may be running and select "Next."
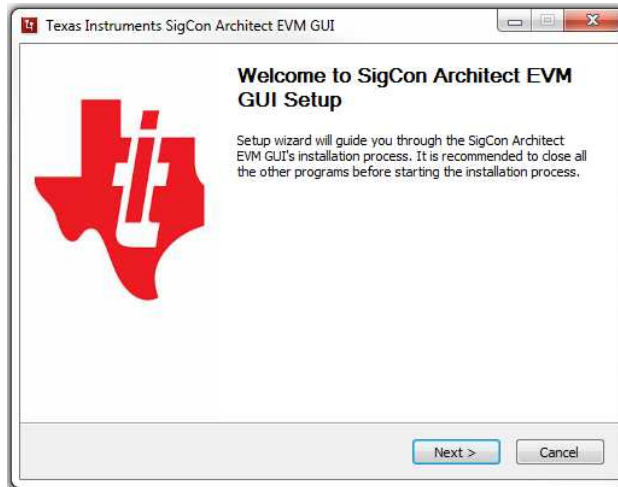

Figure 3. SigCon Architect Setup Wizard

7. Read through the licensing agreement, and accept the terms of the agreement by selecting "I Agree".
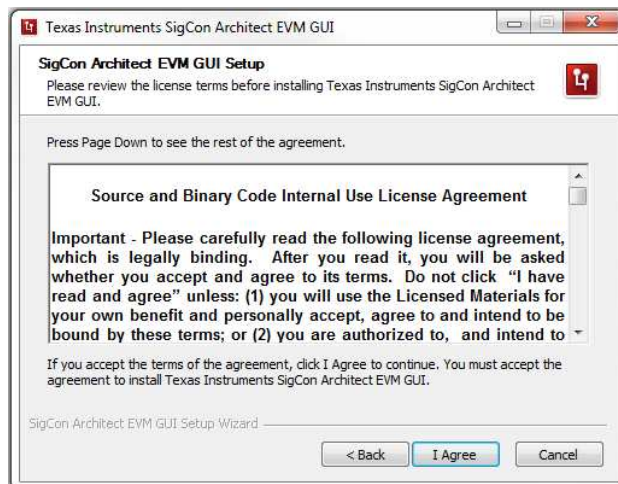

Figure 4. SigCon Architect License Agreement

8. If you are installing without LabVIEW RTE 2012 embedded (SNLC054), skip to Step 9. If you are installing with LabVIEW RTE 2012 embedded (SNLC055), a second licensing agreement for National Instruments Software will appear. Read through this agreement, and accept the terms of the agreement by selecting "I Agree."
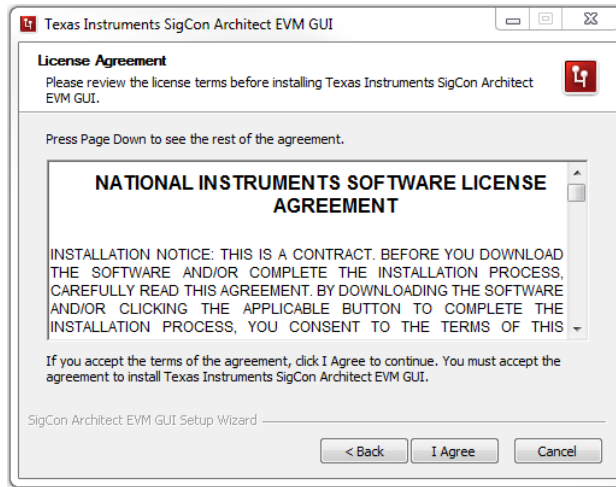

Figure 5. National Instruments Software License Agreement

9. Choose a location to install SigCon Architect and select "Next." By default, SigCon Architect will install under "C:\Program Files (x86)\Texas Instruments\SigCon Architect EVM GUI."

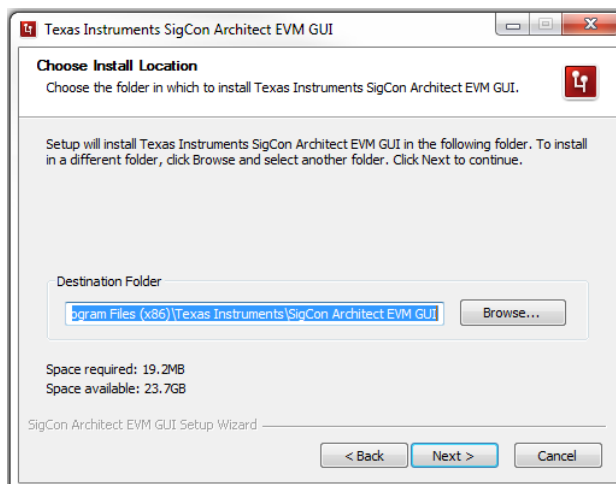**NOTE:** The space required for the GUI is approximately 25 MB, and LabVIEW RTE is approximately 316 MB.

Figure 6. Choose Install Location Dialog Box

10. A window will appear with the components necessary for running SigCon Architect. "Python" is Python v2.7, "LV2012 RTE" is the LabVIEW 2012 Run-Time Engine, and "EVM GUI" is the SigCon Architect interface. For proper installation, leave all components checked to install.

> **NOTE:** LV2012 RTE will only appear as an installation option when running SigCon Architect Installer wRTE (SNLC055).

> **NOTE:** Components that are already installed on the PC will not appear as an option for installation. For example, if you already have Python installed, then only "LV2012RTE" and "EVM GUI" will appear.
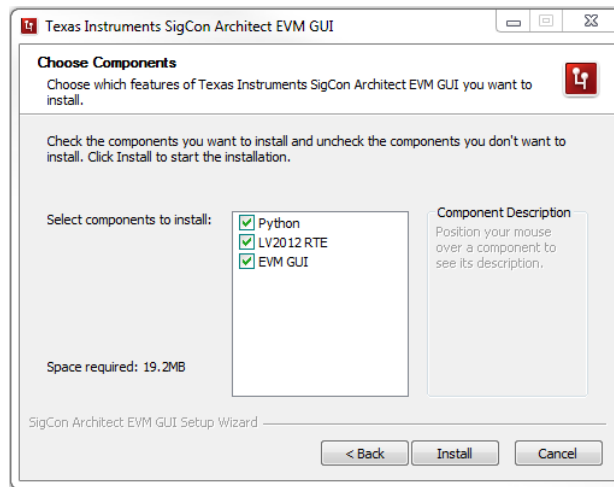

Figure 7. Choose Components Dialog Box

11. Skip to Step 12 if the following apply to you:
    - You are installing SNLC054 (LabVIEW RTE not embedded)
    - You are installing with SNLC055 (LabVIEW RTE embedded) and already have LabVIEW RTE 2012 (or compatible) installed

If you are installing with SigCon Architect Installer wRTE (SNLC055) and do **not** already have LabVIEW RTE 2012 (or compatible) installed previously, the installer will use a local LabVIEW RTE setup.exe file to install. During this process, your PC may show a screen similar to Figure 8.
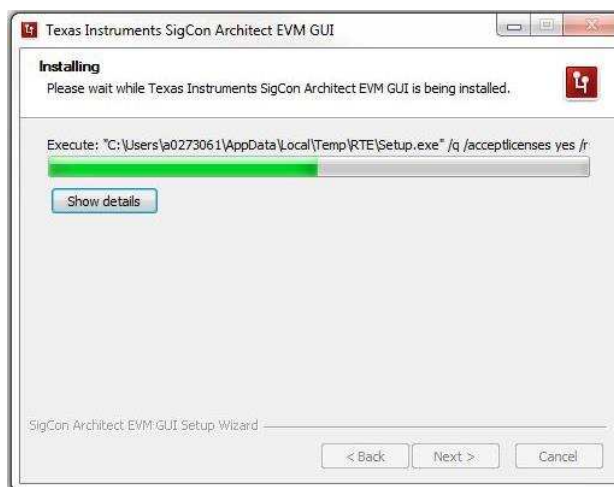

Figure 8. Installation Dialog in Installer

After LabVIEW RTE and SigCon Architect have been installed, you will be prompted to restart your computer. Click "OK" to restart. If installation is not successful, see Step 13.
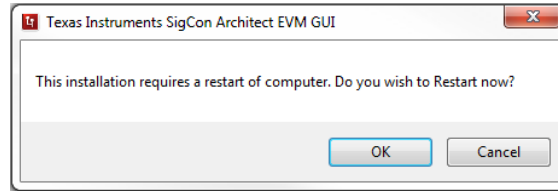

Figure 9. Restart Prompt after SigCon Architect Installation

After restarting your PC, SigCon Architect is ready to run. Skip to Step 14.

12. If LabVIEW RTE installation is not required, the installer will show the screen in Figure 10 after installation is complete. By default, "Run SigCon Architect EVM GUI" is checked and "Create Desktop Shortcut" is left unchecked. Click "Finish" to complete SigCon Architect installation.

Figure 10. Successful Installation of SigCon Architect

If you leave "Create Desktop Shortcut" unchecked and wish to create a desktop shortcut icon later, see Step 14.

13. In the event that LabVIEW RTE fails to install and you attempt to open SigCon Architect anyway, the error in Figure 11 will appear. Select "Yes" to launch a URL that will bring you to the LabVIEW RTE download page, after which you can install LabVIEW RTE directly from NI.com.
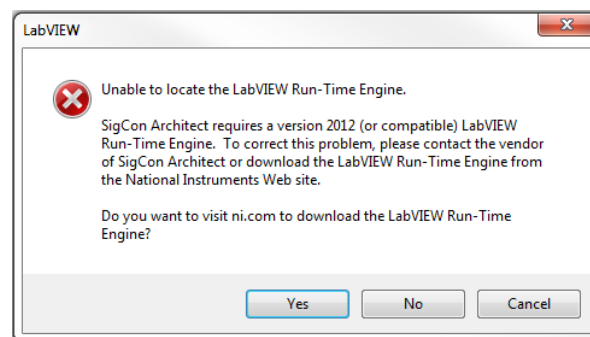

Figure 11. Error Dialog when Attempting to Run SigCon Architect without the RTE

After installing LabVIEW RTE successfully from NI.com, restart your PC. Continue to Step 14.

14. SigCon Architect can now be accessed in the Start Menu under "All Programs" → "Texas Instruments" → "SigCon Architect EVM GUI."

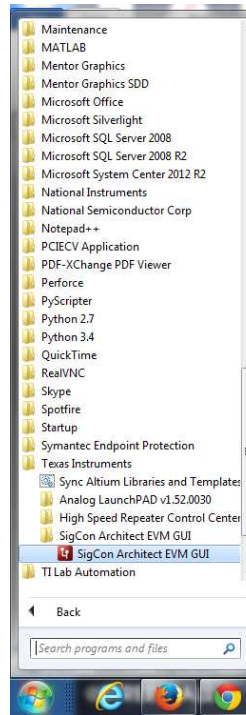**Figure 12. SigCon Architect EVM GUI in "All Programs"**

15. To create a desktop shortcut, right-click on the SigCon Architect EVM GUI icon and select "Send to" → "Desktop (create shortcut)."
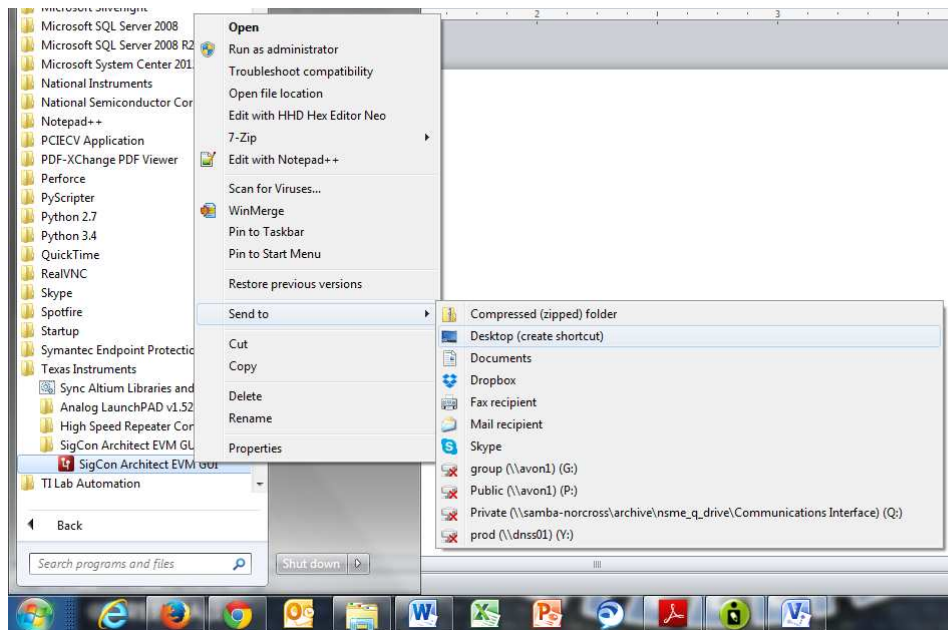

Figure 13. Create Desktop Shortcut for SigCon Architect

16. The desktop shortcut icon for SigCon Architect will then appear. This completes SigCon Architect installation.

Figure 14. SigCon Architect Desktop Shortcut

3.2   *Uninstallation*

1. Close any instance of SigCon Architect that is running before continuing with uninstallation, or else the program will not uninstall properly.
2. Locate the folder where the GUI was installed. This can be achieved by right-clicking on the GUI icon and selecting "Properties" → "Open File Location." By default, SigCon Architect is located in "C:\Program Files (x86)\Texas Instruments\SigCon Architect EVM GUI."
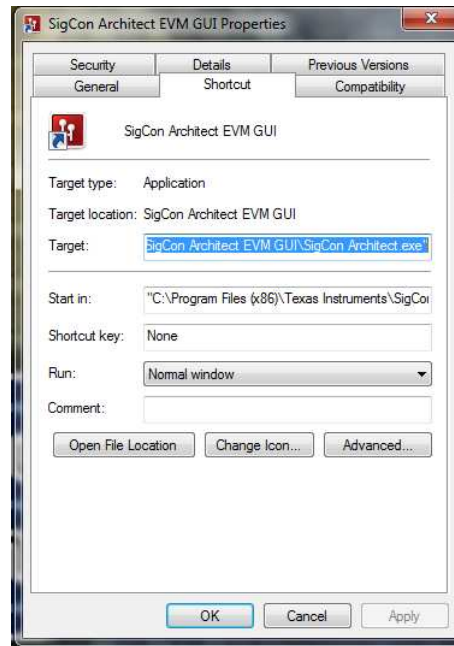

Figure 15. SigCon Architect Properties Dialog Box

3. The window that contains the program files will appear. Run "uninstall.exe."
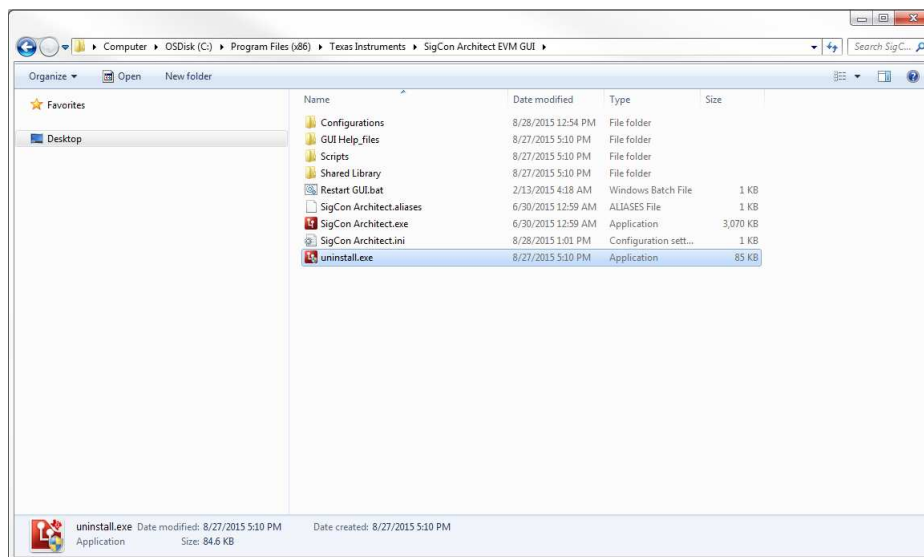
Figure 16. SigCon Architect Uninstallation Directory

4.   The SigCon Architect Uninstaller will appear as shown in Figure 17. Select "Uninstall" to continue.

Figure 17. SigCon Architect Uninstaller

5.   After successful uninstallation, a confirmation message will appear. Select "Finish." The program should now be uninstalled from the computer.

> **NOTE:** This uninstaller will only uninstall SigCon Architect. To uninstall the LabVIEW RTE, you must use the Control Panel to uninstall LabView RTE separately.

Figure 18. SigCon Architect Uninstallation Complete

4   Installing Profile Updaters

SigCon Architect is designed as an add-on based software. This means that you must install the SigCon Architect add-on profile for a desire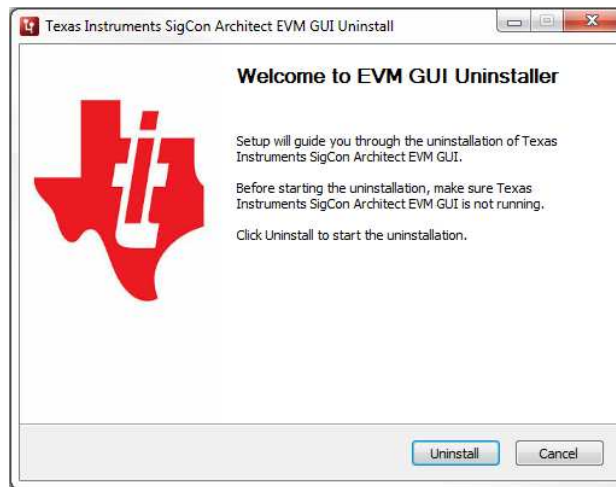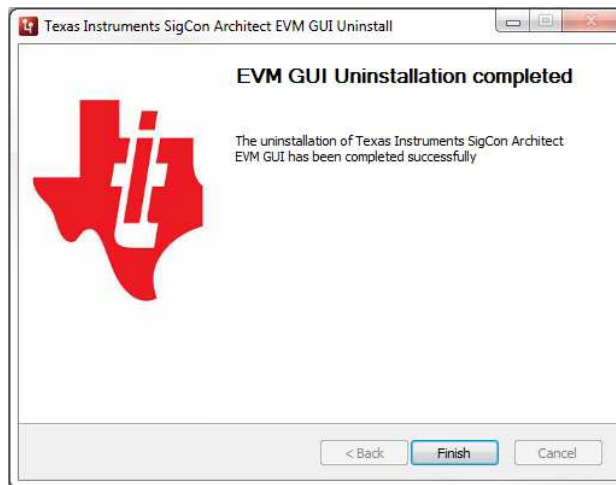d device IC in order to control the IC within SigCon Architect. The executables to update SigCon Architect with these add-on profiles are called "Profile Updaters."

After initial installation, there will only be one device profile available: LMH1218. See the default SigCon Architect view in Figure 19.
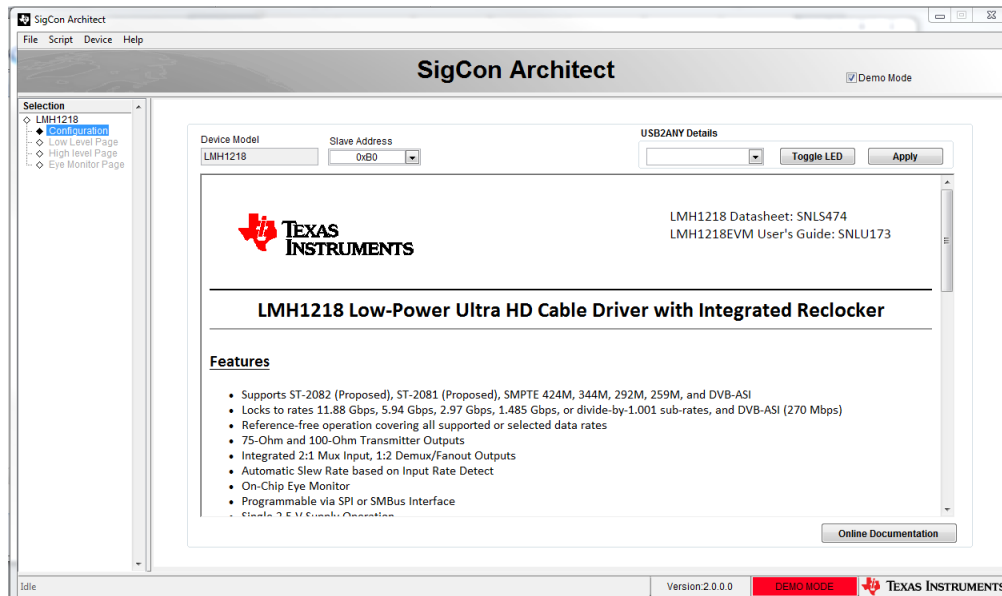
Figure 19. Default SigCon Architect Profile

As an example of how to install a profile updater, consider the situation where a user wants to control the DS80PCI810 repeater with SigCon Architect. In order to do this, the user must install the DS80PCI810 profile updater. To add the DS80PCI810 profile to SigCon Architect, follow these steps:

1. **Close all existing instances of SigCon Architect.** This is an important step to ensure that the installer updater works properly. Otherwise, the updater will not load correctly into SigCon Architect.

2. Navigate to the SigCon Architect Tools Folder page in TI.com and download the zip folder containing the collection of repeater profiles. A view of the zip folder contents can be seen in Figure 20.
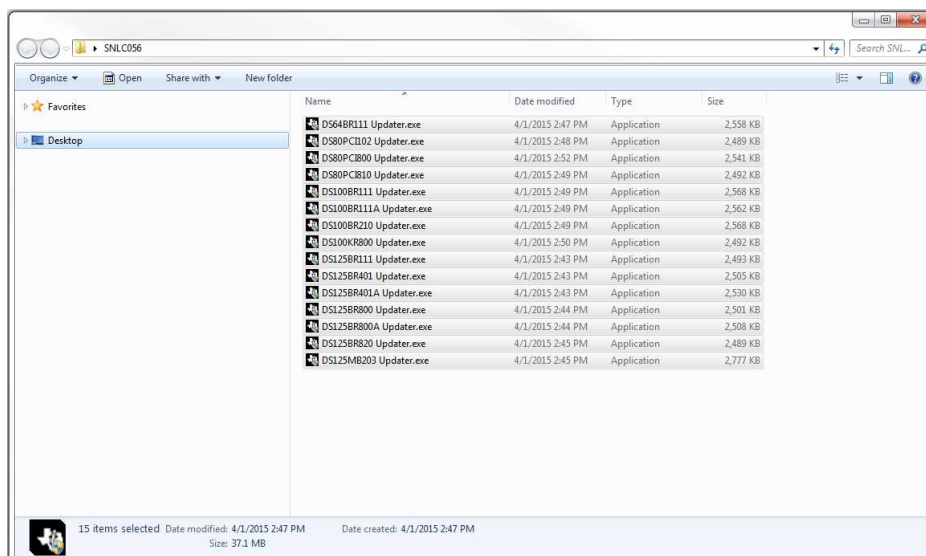
Figure 20. Repeater Profiles .zip Folder Contents

3. Double-click and run the desired updater profile in order to add it to SigCon Architect. In this case, run "DS80PCI810 Updater.exe."
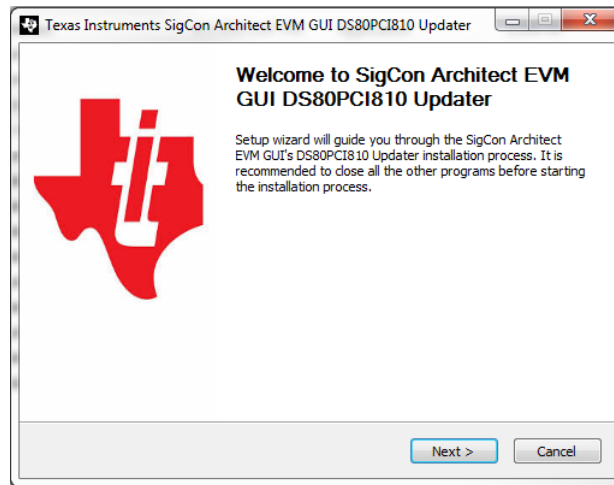
Figure 21. Welcome Page for DS80PCI810 Updater

4. Click "Next." Select "I Agree" when you reach the TI User License Agreement.
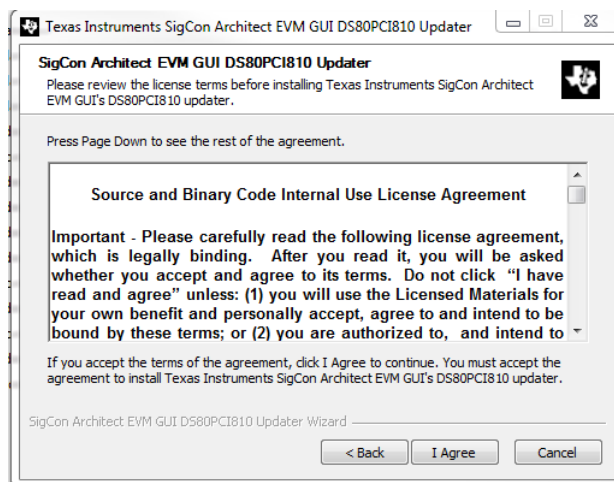
Figure 22. TI User License Agreement Page

Once installation is successful, the screen in Figure 23 will appear.
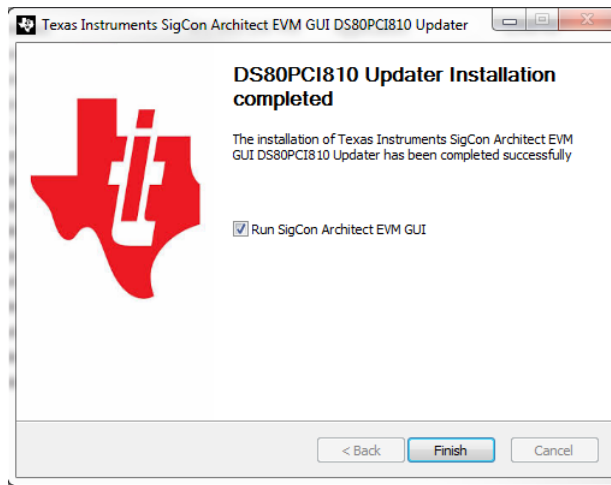
Figure 23. DS80PCI810 Updater Installation Completion Page

5. Click "Finish" to run SigCon Architect again. The DS80PCI810 profile will now be available underneath the LMH1218 profile. You have successfully installed the DS80PCI810 profile updater to SigCon Architect.
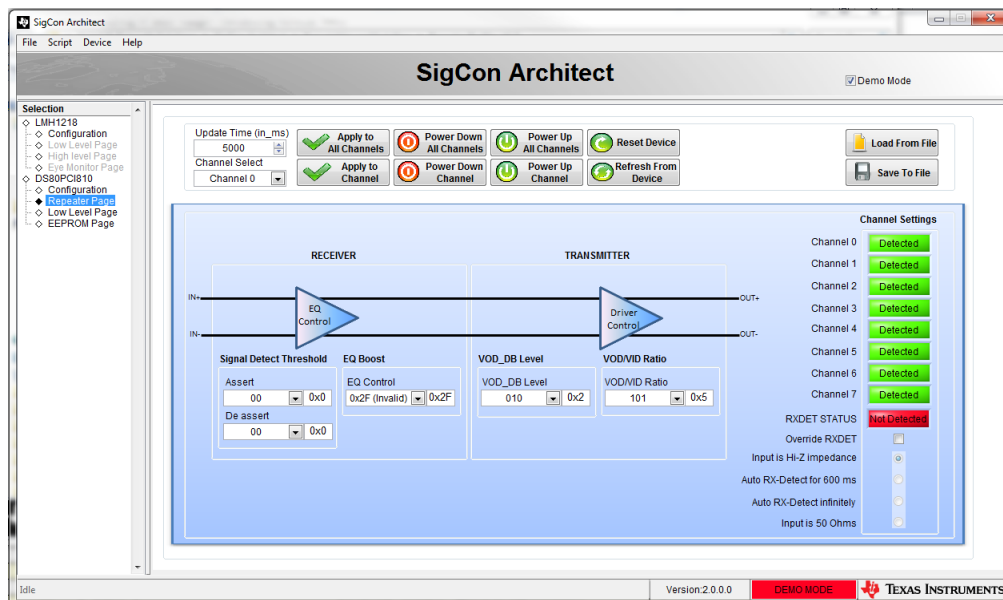
Figure 24. SigCon Architect GUI with DS80PCI810 Profile Added in the Left Column

5 Getting Started

This section contains a brief set of instructions regarding how to set up a DPS-DONGLE-EVM with SigCon Architect to talk to a live device.

Items Needed:

- PC with SigCon Architect installed (installation instructions in previous sections)
- DPS-DONGLE-EVM with USB cable and pin connector jumper wires (see Figure 25 - Figure 27)
- Evaluation Module (EVM) supported by SigCon Architect
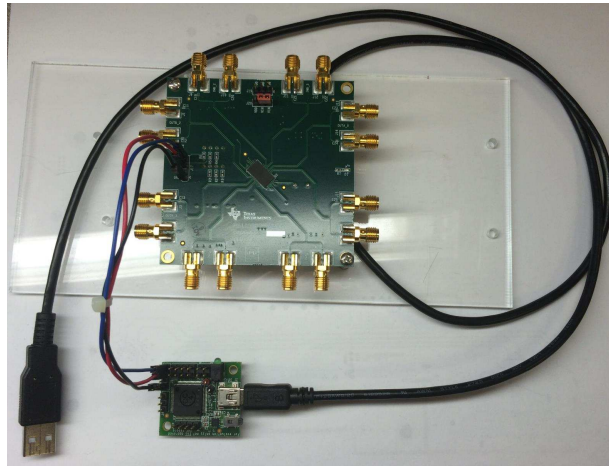
Figure 25. Example of DPS-DONGLE-EVM Connected to a DS125BR401AEVM
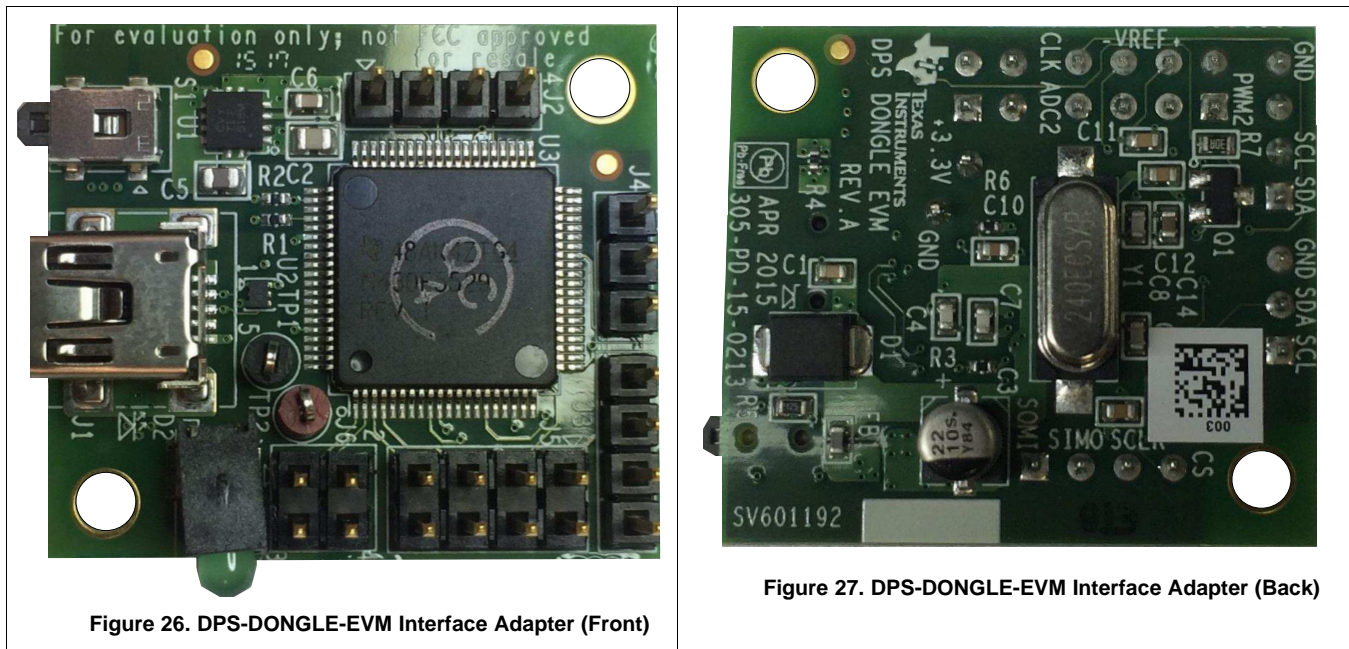
Figure 26. DPS-DONGLE-EVM Interface Adapter (Front)

Figure 27. DPS-DONGLE-EVM Interface Adapter (Back)

In the following example, the DPS-DONGLE-EVM is used with the DS125BR820EVM. The following instructions detail how to establish connection between PC and DS125BR820.

1. Install SigCon Architect with the steps detailed in Section 3.1.

2. Install the "DS125BR820 Updater.exe" file with the steps detailed in Section 4.

3. Verify the profile can load correctly in Demo Mode by selecting the DS125BR820 Configuration Page and clicking "Apply" in the top right corner to unlock the three tabs beneath the Configuration Page.
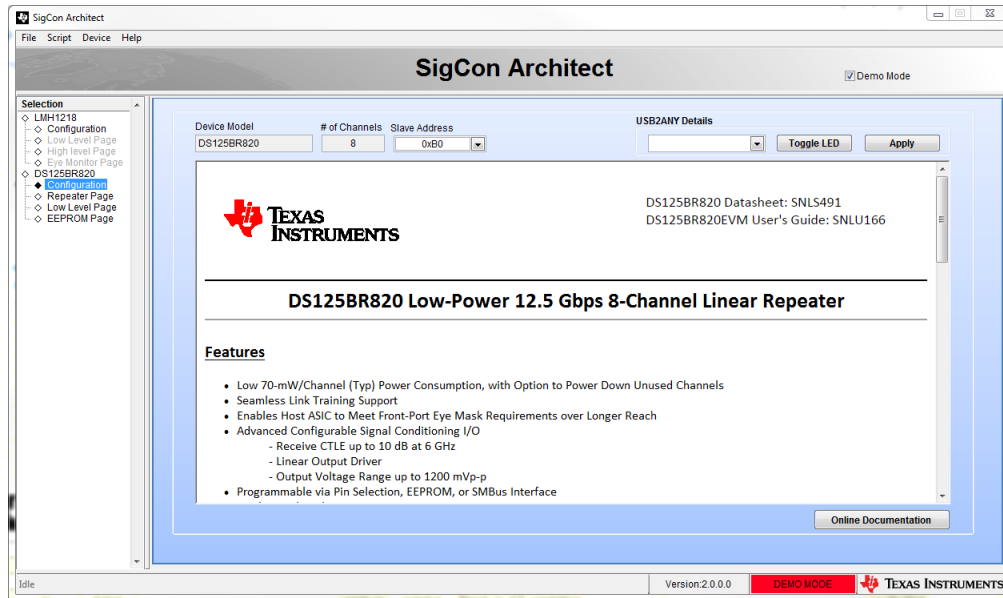
Figure 28. SigCon Architect DS125BR820 Profile after All Pages are Unlocked

4. Once the profile has been verified to work in Demo Mode, close SigCon Architect.

5. Provide a valid high speed data signal from a generator to one of the channels on the DS125BR820EVM, and connect the output of the same channel to a high speed oscilloscope. Provide power to the EVM as shown in Figure 29.
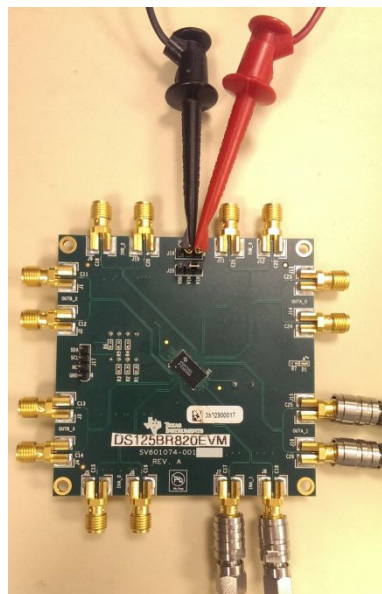
Figure 29. EVM Board with Power and High-Speed Signal Connected

6. Place the EVM in SMBus Slave Mode and set the device address to 0xB0. Refer to the EVM User's Guide and device datasheet for detailed instructions about setting the repeater SMBus address settings.

7. Using a USB-to-miniUSB cable, plug the DPS-DONGLE-EVM into the PC. Then, locate the SMBus header pins on the DPS-DONGLE-EVM according to Figure 30.

NOTE: Users can select either J3 or J4 to access the SDA, SCL, and GND pins.
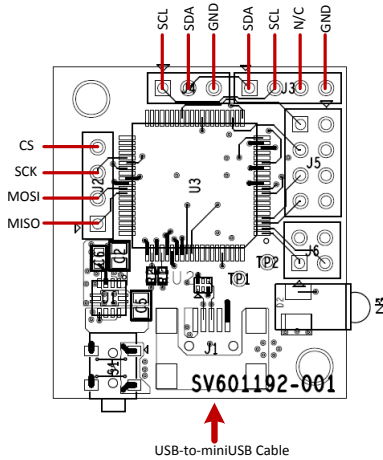
Figure 30. DPS-DONGLE-EVM Connection Diagram

8. Plug the pin connector cable into the SMBus lines of the EVM. The connection to the DS125BR820EVM is shown in Figure 31.
   - Black → Ground
   - Green → SDA
   - White → SCL
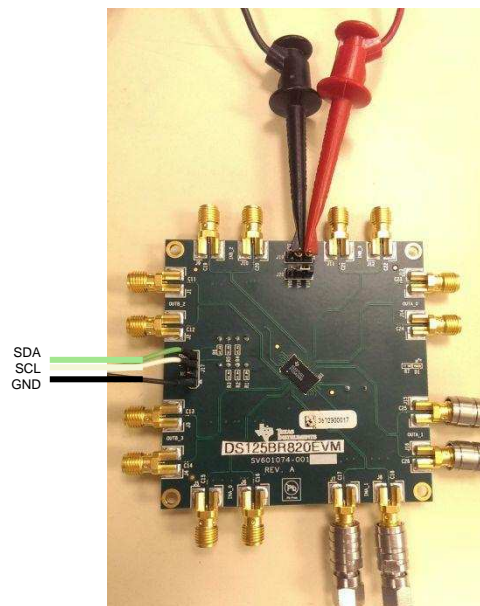
Figure 31. SMBus EVM Pin Connections Example

9. Open SigCon Architect. The program should automatically detect the USB2ANY on the DPS-DONGLE-EVM. However, since the LMH1218 profile is the first profile that appears on the left column in SigCon Architect, the software may output an "Invalid Address" warning, because it is assuming a connection to the LMH1218 default address, 0x1A. To fix this, click "Continue" and then click on the DS125BR820 Configuration Page. Verify that the Slave Address is set via the drop-down menu to "0xB0." To verify connection, click "Apply."
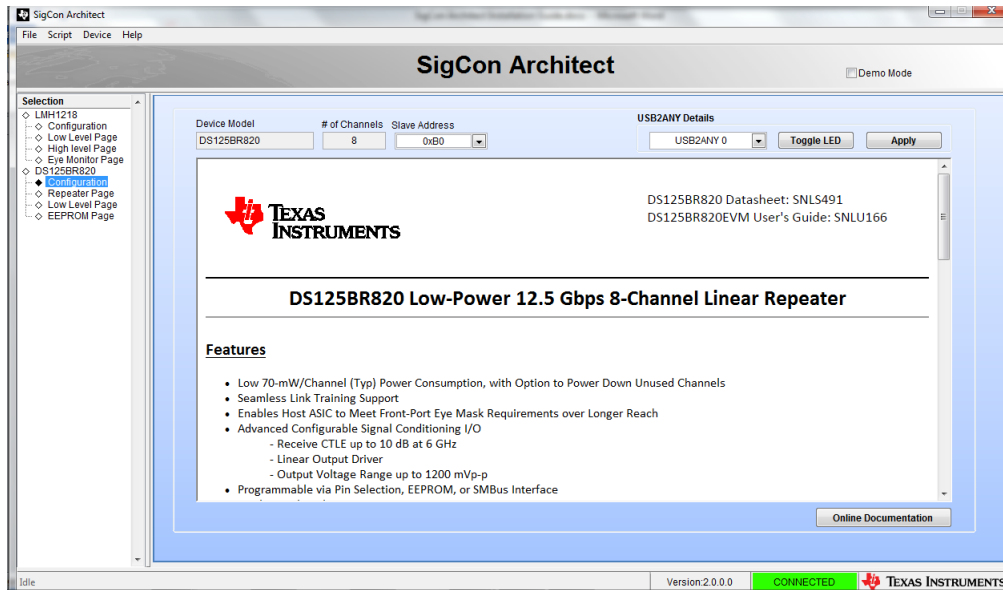
Figure 32. SigCon Architect DS125BR820 Successful Connection at Address 0xB0

10. Once connection is successful, the status bar at the bottom right of the GUI should appear green and state "Connected." If the status bar does not show this, verify that the Slave Address is correct and then attempt to connect to the DPS-DONGLE-EVM by selecting "Apply" at the top right of the configuration page. If the USB2ANY still does not connect, close SigCon Architect and unplug the DPS-DONGLE-EVM. Afterwards, plug the DPS-DONGLE-EVM back in, and then reopen SigCon Architect and retry Step 9.
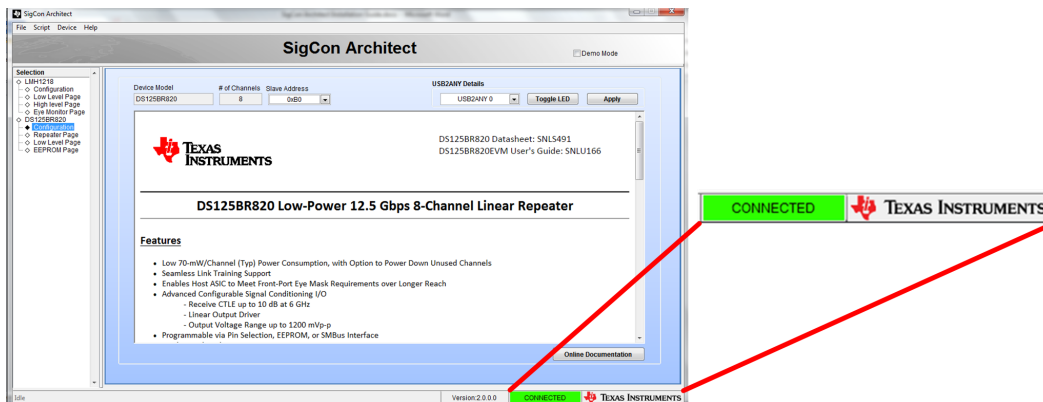
Figure 33. Status Bar Informing the User of a Successful PC-to-EVM Connection

11. Select the "Repeater Page" on the DS125BR820 profile. The page should look similar to Figure 34. Notice that the status on the right side of the page says "Detected" for the active channel under test (Channel 5).
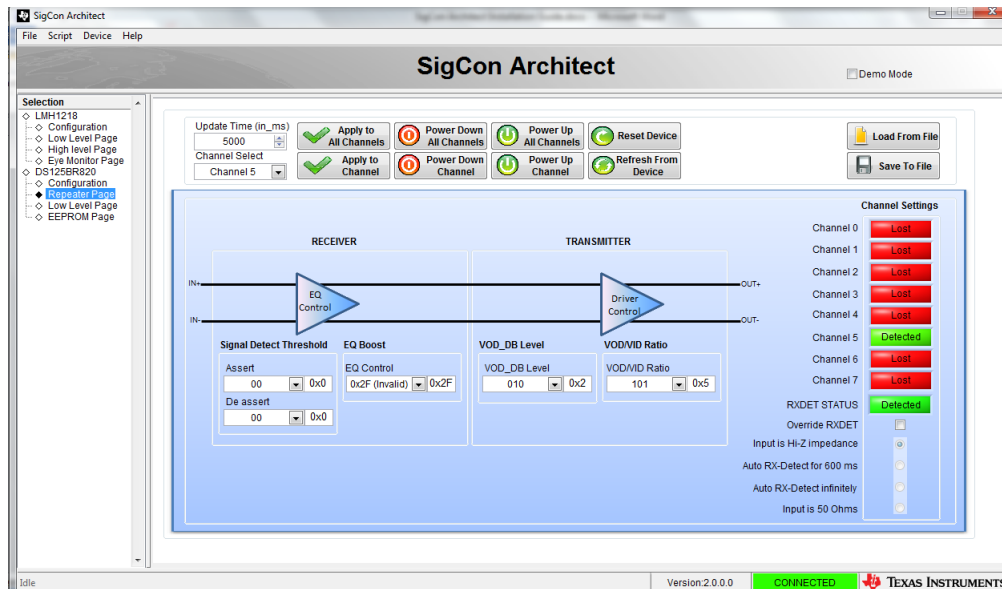
Figure 34. Repeater Page with Device Connected

12. After verifying successful PC-to-EVM communication, you can configure the repeater settings further with the high level "Repeater Page" for general configuration settings or the "Low Level Page" for bit-by-bit register programming.

6   Live Mode v. Demo Mode

SigCon Architect can operate in Live Mode or Demo Mode. The key differences between the two operation modes is summarized below:

Live Mode	Demo Mode
Allows Read/Write access to registers in live devices.	Allows Read/Write capability for registers in simulation devices.
Allows users to have one GUI interface to communicate with multiple devices on the same SMBus line in real-time.	Allows users to view programmed settings from previous designs and save desired programmed settings for future designs.
For repeaters and retimers, the EEPROM page can be used to read EEPROM hex file data and transfer settings from an individual slot to a live device.	For repeaters and retimers, the EEPROM page be used to read and program EEPROM hex file data for a simulation device.

When using SigCon Architect, the software always attempts to enter Live Mode first. If a connection to a DPS-DONGLE-EVM or USB2ANY inferace equivalent is not detected when loading SigCon Architect, a warning will display before any profile can load.
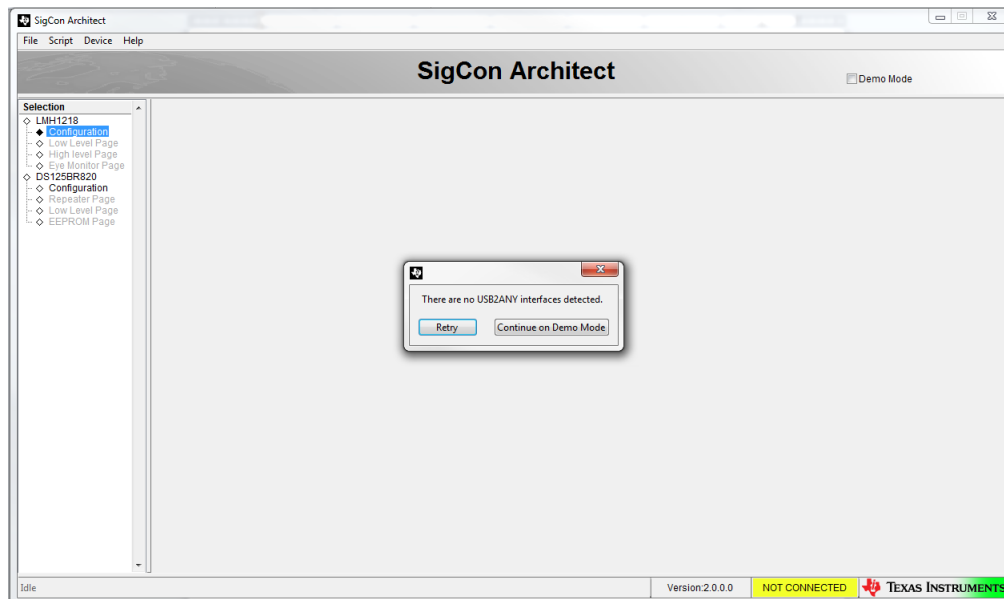
Figure 35. Warning Message when No USB2ANY Device is Detected

If no live device is used, then click "Continue on Demo Mode" to enter Demo Mode.

If there is a live device attached and the warning message still appears, close SigCon Architect. Remove and then reconnect the DPS-DONGLE-EVM to the PC. Finally, re-open SigCon Architect to establish successful communication between PC and DPS-DONGLE-EVM.

If the device slave address does not match the Slave Address field for the selected device profile, the warning message in Figure 36 will display. Verify that the correct address is set for the device before attempting communication. Whenever connection with an endpoint device is lost, users can either close SigCon Architect by clicking "Stop", or continue on in Demo Mode. If, at any time, a live connection to an endpoint device becomes available, unclick the "Demo Mode" checkbox on the top right of the GUI window to re-enter Live Mode.
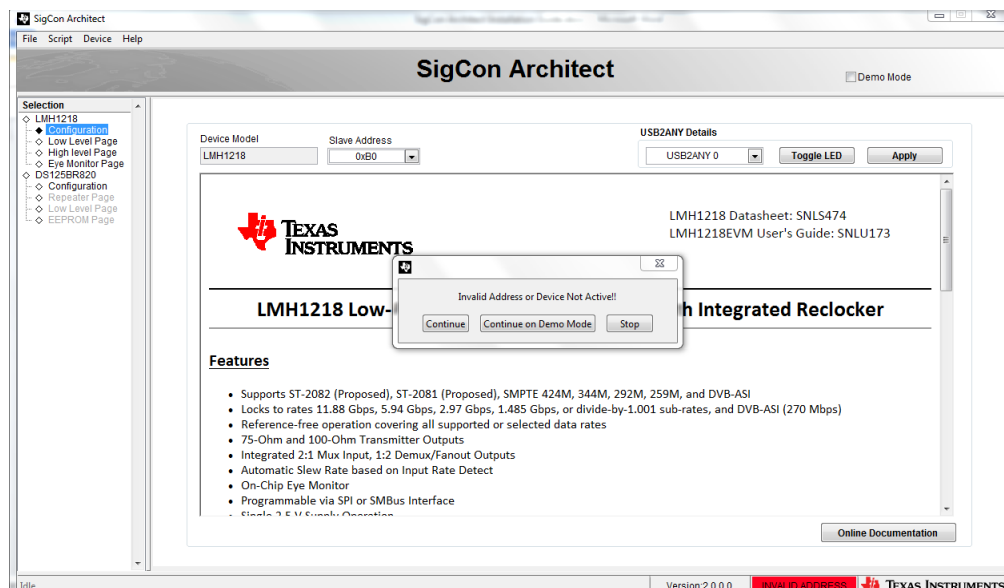
Figure 36. Warning Message when the Slave Address in SigCon Architect is Incorrect

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

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STANDARD TERMS AND CONDITIONS FOR EVALUATION MODULES

1. *Delivery:* TI delivers TI evaluation boards, kits, or modules, including any accompanying demonstration software, components, or documentation (collectively, an "EVM" or "EVMs") to the User ("User") in accordance with the terms and conditions set forth herein. Acceptance of the EVM is expressly subject to the following terms and conditions.

   1.1 EVMs are intended solely for product or software developers for use in a research and development setting to facilitate feasibility evaluation, experimentation, or scientific analysis of TI semiconductors products. EVMs have no direct function and are not finished products. EVMs shall not be directly or indirectly assembled as a part or subassembly in any finished product. For clarification, any software or software tools provided with the EVM ("Software") shall not be subject to the terms and conditions set forth herein but rather shall be subject to the applicable terms and conditions that accompany such Software

   1.2 EVMs are not intended for consumer or household use. EVMs may not be sold, sublicensed, leased, rented, loaned, assigned, or otherwise distributed for commercial purposes by Users, in whole or in part, or used in any finished product or production system.

2 *Limited Warranty and Related Remedies/Disclaimers*:

   2.1 These terms and conditions do not apply to Software. The warranty, if any, for Software is covered in the applicable Software License Agreement.

   2.2 TI warrants that the TI EVM will conform to TI's published specifications for ninety (90) days after the date TI delivers such EVM to User. Notwithstanding the foregoing, TI shall not be liable for any defects that are caused by neglect, misuse or mistreatment by an entity other than TI, including improper installation or testing, or for any EVMs that have been altered or modified in any way by an entity other than TI. Moreover, TI shall not be liable for any defects that result from User's design, specifications or instructions for such EVMs. Testing and other quality control techniques are used to the extent TI deems necessary or as mandated by government requirements. TI does not test all parameters of each EVM.

   2.3 If any EVM fails to conform to the warranty set forth above, TI's sole liability shall be at its option to repair or replace such EVM, or credit User's account for such EVM. TI's liability under this warranty shall be limited to EVMs that are returned during the warranty period to the address designated by TI and that are determined by TI not to conform to such warranty. If TI elects to repair or replace such EVM, TI shall have a reasonable time to repair such EVM or provide replacements. Repaired EVMs shall be warranted for the remainder of the original warranty period. Replaced EVMs shall be warranted for a new full ninety (90) day warranty period.

3 *Regulatory Notices:*

   3.1 *United States*

   3.1.1 *Notice applicable to EVMs not FCC-Approved:*

   This kit is designed to allow product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

   3.1.2 *For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:*

   CAUTION

   This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

   FCC Interference Statement for Class A EVM devices

   NOTE: 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.

FCC Interference Statement for Class B EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *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.*

3.2 *Canada*

  3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-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.

Concernant les EVMs avec appareils radio:

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.

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.

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

3.3 *Japan*

  3.3.1 *Notice for EVMs delivered in Japan:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。
http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page

  3.3.2 *Notice for Users of EVMs Considered "Radio Frequency Products" in Japan:* EVMs entering Japan may not be certified by TI as conforming to Technical Regulations of Radio Law of Japan.

If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required by Radio Law of Japan to follow the instructions below with respect to EVMs:

1. Use EVMs 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 EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or

3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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2. 実験局の免許を取得後ご使用いただく。
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3.3.3 *Notice for EVMs for Power Line Communication:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page
電力線搬送波通信についての開発キットをお使いになる際の注意事項については、次のところをご覧ください。 http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page

4 *EVM Use Restrictions and Warnings:*

4.1 EVMS ARE NOT FOR USE IN FUNCTIONAL SAFETY AND/OR SAFETY CRITICAL EVALUATIONS, INCLUDING BUT NOT LIMITED TO EVALUATIONS OF LIFE SUPPORT APPLICATIONS.

4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.

4.3 *Safety-Related Warnings and Restrictions:*

4.3.1 User shall operate the EVM within TI's recommended specifications and environmental considerations stated in the user guide, other available documentation provided by TI, and any other applicable requirements and employ reasonable and customary safeguards. Exceeding the specified performance ratings and specifications (including but not limited to input and output voltage, current, power, and environmental ranges) for the EVM may cause personal injury or death, or property damage. If there are questions concerning performance ratings and specifications, User should 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 also result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM user 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, even with the inputs and outputs kept within the specified allowable ranges, some circuit components may have elevated case temperatures. These components include but are not limited to linear regulators, switching transistors, pass transistors, current sense resistors, and heat sinks, which can be identified using the information in the associated documentation. When working with the EVM, please be aware that the EVM may become very warm.

4.3.2 EVMs are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems. User assumes all responsibility and liability for proper and safe handling and use of the EVM by User or its employees, affiliates, contractors or designees. User assumes all responsibility and liability to ensure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard. User assumes all responsibility and liability for any improper or unsafe handling or use of the EVM by User or its employees, affiliates, contractors or designees.

4.4 User assumes all responsibility and liability to determine whether the EVM is subject to any applicable international, federal, state, or local laws and regulations related to User's handling and use of the EVM and, if applicable, User assumes all responsibility and liability for compliance in all respects with such laws and regulations. User assumes all responsibility and liability for proper disposal and recycling of the EVM consistent with all applicable international, federal, state, and local requirements.

5. *Accuracy of Information:* To the extent TI provides information on the availability and function of EVMs, TI attempts to be as accurate as possible. However, TI does not warrant the accuracy of EVM descriptions, EVM availability or other information on its websites as accurate, complete, reliable, current, or error-free.

6. *Disclaimers:*

6.1 EXCEPT AS SET FORTH ABOVE, EVMS AND ANY WRITTEN DESIGN MATERIALS PROVIDED WITH THE EVM (AND THE DESIGN OF THE EVM ITSELF) ARE PROVIDED "AS IS" AND "WITH ALL FAULTS." TI DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING SUCH ITEMS, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADE SECRETS OR OTHER INTELLECTUAL PROPERTY RIGHTS.

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7. *USER'S INDEMNITY OBLIGATIONS AND REPRESENTATIONS.* USER WILL 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 HANDLING OR USE OF THE EVM THAT IS NOT IN ACCORDANCE WITH THESE TERMS AND CONDITIONS. THIS OBLIGATION SHALL APPLY WHETHER CLAIMS ARISE UNDER STATUTE, REGULATION, OR THE LAW OF TORT, CONTRACT OR ANY OTHER LEGAL THEORY, AND EVEN IF THE EVM FAILS TO PERFORM AS DESCRIBED OR EXPECTED.

8. *Limitations on Damages and Liability:*

8.1 *General Limitations.* IN NO EVENT SHALL TI BE LIABLE FOR ANY SPECIAL, COLLATERAL, INDIRECT, PUNITIVE, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES IN CONNECTION WITH OR ARISING OUT OF THESE TERMS ANDCONDITIONS OR THE USE OF THE EVMS PROVIDED HEREUNDER, REGARDLESS OF WHETHER TI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED TO, COST OF REMOVAL OR REINSTALLATION, ANCILLARY COSTS TO THE PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, RETESTING, OUTSIDE COMPUTER TIME, LABOR COSTS, LOSS OF GOODWILL, LOSS OF PROFITS, LOSS OF SAVINGS, LOSS OF USE, LOSS OF DATA, OR BUSINESS INTERRUPTION. NO CLAIM, SUIT OR ACTION SHALL BE BROUGHT AGAINST TI MORE THAN ONE YEAR AFTER THE RELATED CAUSE OF ACTION HAS OCCURRED.

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10. *Governing Law:* These terms and conditions shall be governed by and interpreted in accordance with the laws of the State of Texas, without reference to conflict-of-laws principles. User agrees that non-exclusive jurisdiction for any dispute arising out of or relating to these terms and conditions lies within courts located in the State of Texas and consents to venue in Dallas County, Texas. Notwithstanding the foregoing, any judgment may be enforced in any United States or foreign court, and TI may seek injunctive relief in any United States or foreign court.

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