SimSinter INSTALLATION GUIDE

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1. INTRODUCTION

SimSinter is a standard interface library for driving single-process Windows®-based simulation software. SimSinter supports Aspen Plus®, Aspen Custom Modeler® (ACM), PSE gPROMS, and Microsoft® Excel®. Additional simulators are planned for future releases. When called, SimSinter can open the simulator, initialize the simulation, set variables in the simulation, run the simulation, and get the resulting output variables from the simulation. SimSinter is an integral part of the Gateway and every other CCSI tool that runs Aspen.

SimSinter is used by the Turbine Gateway, but users may also choose to use SimSinter directly in three other ways:

1. SimSinter can be driven from Microsoft Excel
2. SimSinter comes with multiple command line tools for running jobs, getting data from simulators, and debugging.
3. SimSinter comes with a GUI for generating the Sinter Config files.

Further documentation about how to use SimSinter is available in the SimSinter User Manual.

In order to drive a simulation SimSinter requires two files:

1. The simulation file to run. The simulation file is simulator specific. It defines the simulation for the simulator. For example, for AspenPlus this file may be a .bkp or .apw file.
2. The sinter configuration file. This file gives meta-data about all the input and output variables the simulation writer thinks the user might find useful, including name, type, defaults, units, and possible min and max values. This file is in JSON format.

2. PREREQUISITES

2.1. Hardware

SimSinter requires Windows 7 or 8, running on a minimum 1.00GHz x86 processor with 2 GB RAM.

2.2. Software

SimSinter requires Windows 7 or newer with .NET Framework 4 or higher.
To get any use out of SimSinter you will also need at least one simulator to use it with.
SimSinter currently supports:

- Aspen Plus, version 7.3.2 or newer
- Aspen Custom Modeler (ACM), version 7.3.2 or newer
- PSE gPROMS, version 4.0.0 or newer
- Microsoft Excel, 2010 (14.0) or newer

3. BASIC INSTALLATION

3.1. Third Party Software Installation

As of version 0.2, SimSinter required the CCSIUnits package to be installed. However, CCSIUnits is now included in the same installer with SimSInter, you should not need to install it separately. CCSIUnits provides SimSinter with the ability to do unit of measurement conversions.

SimSinter also requires Microsoft .NET Framework 4. Generally, any up-to-date Windows platform (XP, Vista, 7, or 8) will already have this package installed. If necessary, the .NET framework can be downloaded from Microsoft Update, or at this address:
http://msdn.microsoft.com/en-us/netframework/aa569263.aspx

In order to run a simulation, the correct simulator is also required. SimSinter may use Aspen Plus, Aspen Custom Modeler, GPROMS, or Microsoft Excel. Please install the appropriate simulator by following the simulator vendor provided documentation.

3.2. Product Installation

To install SimSinter:

1. Download SimSinterInstaller.msi
2. Run SimSinterInstaller.msi
3. Click Next
4. Accept the terms of the License agreement
5. Click either the “Typical” or “Complete” button; either will install all of SimSinter. The Custom button may be used to not install certain features.
6. Click the Install button.
7. Give permission for SimSinter to install, enter administrator login information if necessary.
8. Click “Finish” to complete the installation.
9. SimSinter should now be installed and entered into the Windows registry. It should now be accessible by either Microsoft Excel or the command line tools.

4. INSTALLATION TEST

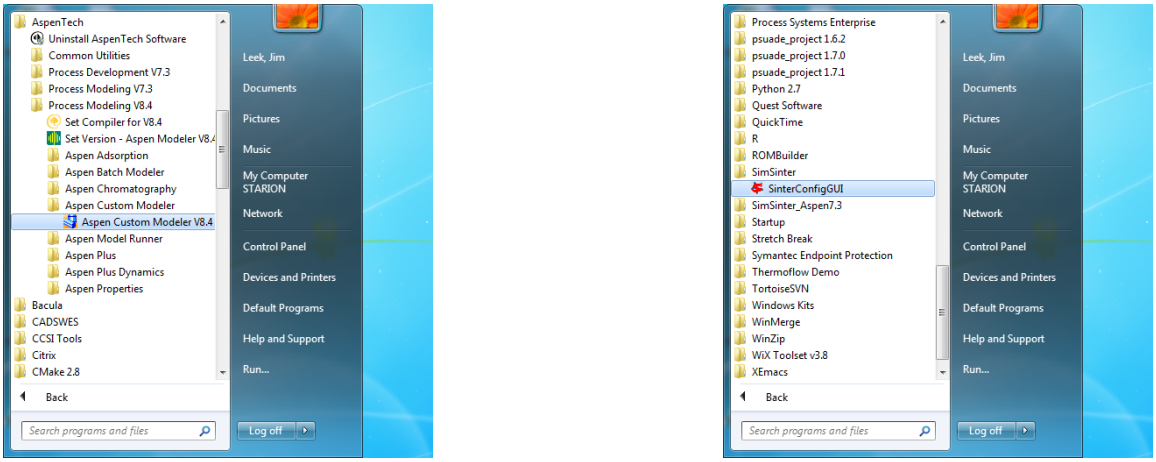
Three tests are included with the SimSinter installation that will allow testing that SimSinter has installed correctly. There is one test for each of the three supported simulators. The tests demonstrate running SimSinter from Microsoft Excel, so to run them you must have Microsoft Excel installed.
To test, please choose the appropriate simulator below and follow the instructions.

4.1. Opening a Simulation with SinterConfigGUI

This is a simple test to make sure that SimSinter is installed correctly, and can correctly open your simulation and simulator.

1. Choose a simulation to open, and make sure you have the correct simulator installed. For example, I will be using the Aspen Custom Modeler simulation included with the

SimSinter install. So I should make sure that I have both Aspen Custom Modeler installed, and SimSinter, as shown in Figure 1.



2. Open SinterConfigGUI by selecting it from the start menu, as in Figure 1.

1. Initially the SimSinter Configuration File Builder splash screen displays, as shown in Figure 2. Either click the splash screen to proceed or wait 10 seconds for the screen to close automatically.

Figure 2: SimSinter Splash Screen

3. The SinterConfigGUI Open Simulation window displays as shown in Figure 3. Click "Browse" to select the file to open and then click "Open File and Configure Variables" to open the file. The user can either open a fresh ACM simulation (.acmf file) or an existing Sinter configuration file. In these instructions, a fresh simulation is opened.
It may take a few minutes after clicking the button to SinterConfigGUI to move on. It must open your simulator, so you must expect it to take at least as long as your simulator normally takes to open. For Aspen products that use a networked license server, this may take as long as a few minutes. During that SinterConfigGUI will remain on the Open

File Page, but the “Attempting to Open Aspen” message will appear at the bottom of the window.

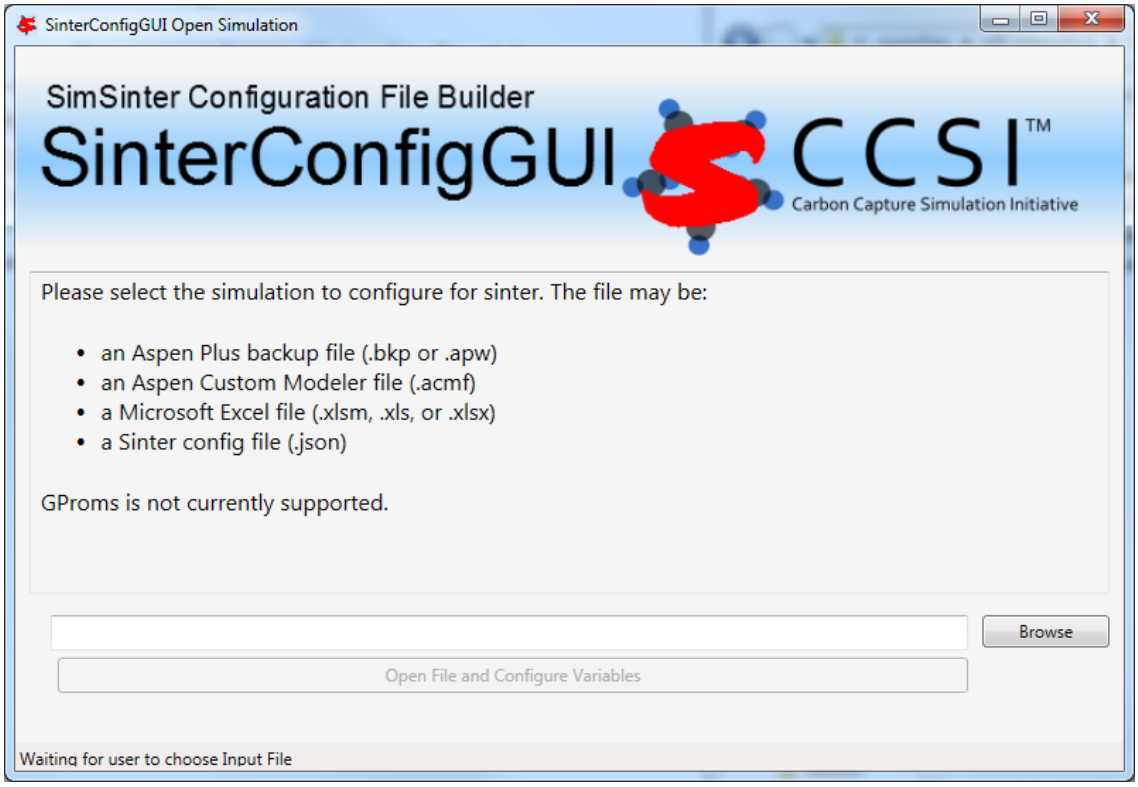


Figure 3: SinterConfigGUI Open Simulation Window

4. Click browse and select your file. I will be opening the ACM demonstration file included with SimSinter in C:\SimSinterFiles\ACM_Install_Test, as in Figure 4.

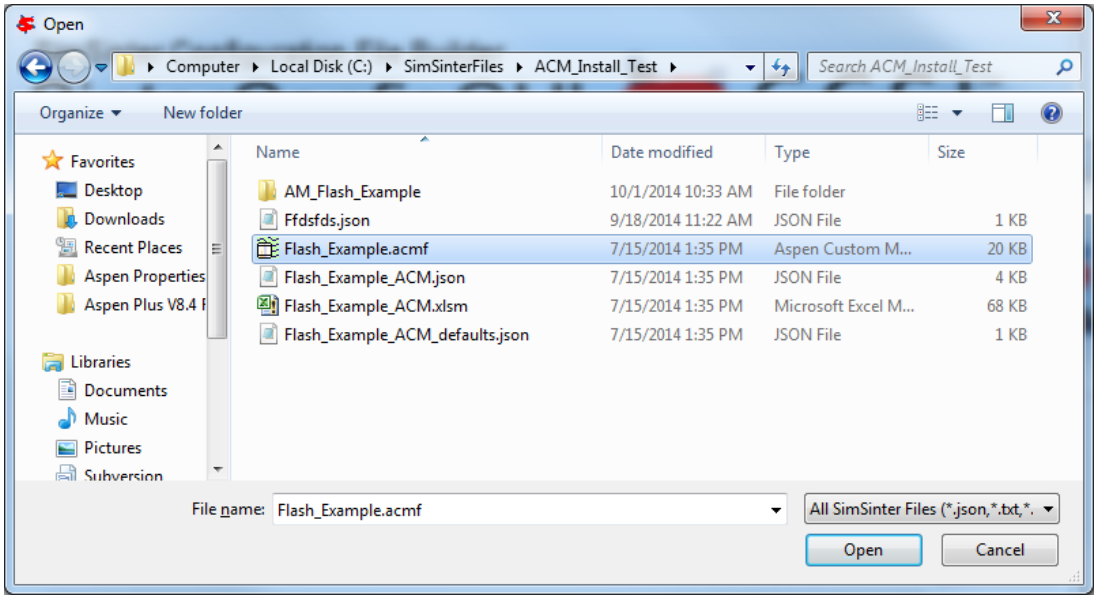


Figure 4: Selecting the simulation file to open

5. Click “Open File and Configure Variables”

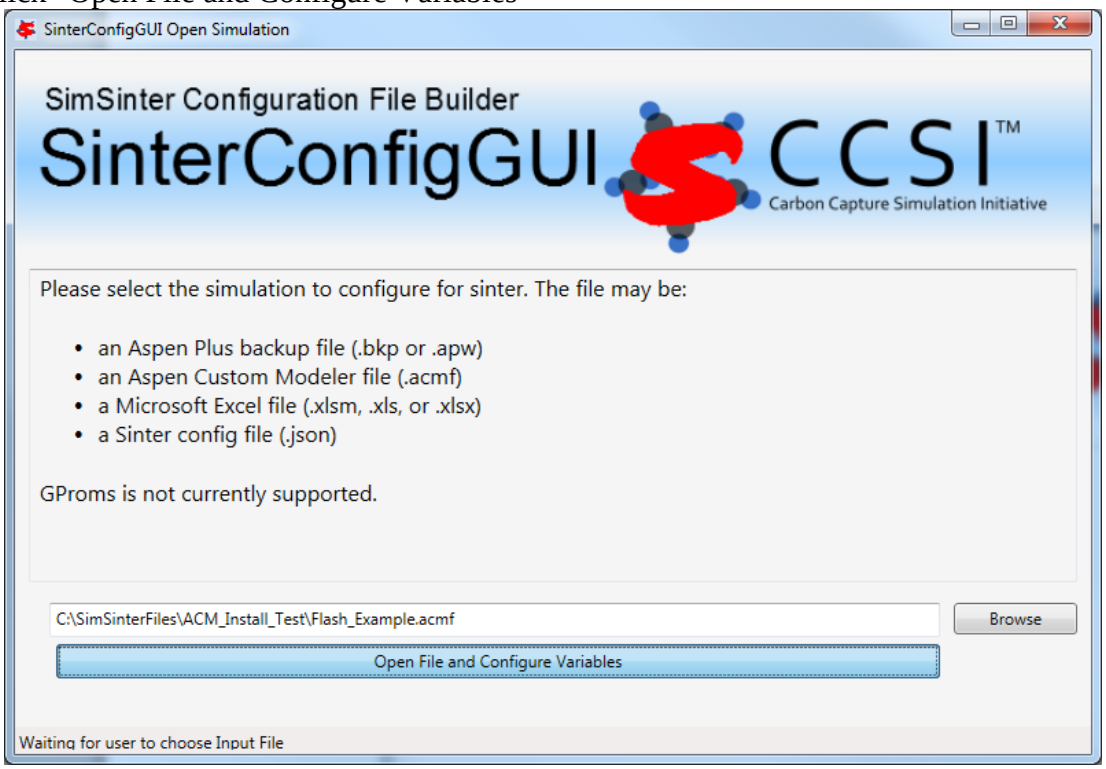


Figure 5: Clicking Open File button

6. It may take a few minutes after clicking the button to SinterConfigGUI to move on. It must open your simulator, so you must expect it to take at least as long as your simulator normally takes to open. For Aspen products that use a networked license server, this may take as long as a few minutes. During that time SinterConfigGUI will remain on the Open Simulation window, but the “Attempting to Open Aspen” message will appear at the bottom of the window.

7. The SinterConfigGUI Simulation Meta-Data window displays as shown in Figure 6. Also, the Aspen Custom Modeler has started up in the background. This is so the user can observe things about the simulation in question as they work on the configuration file

If you see an error instead, please attempt to debug the issue, or contact CCSI support at ccsi-support@george.lbl.gov

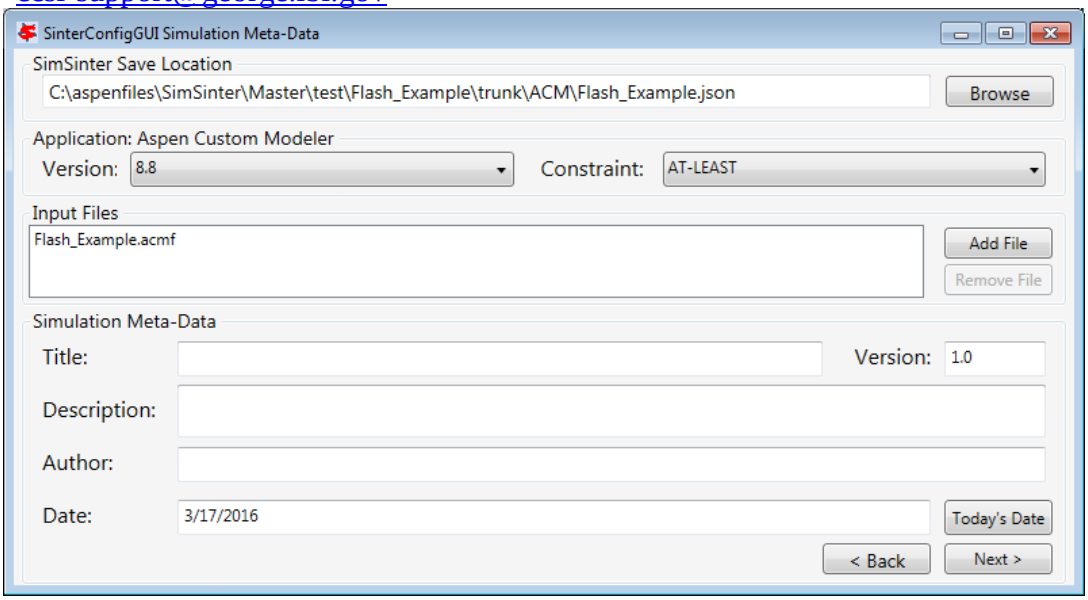


Figure 6: Meta-Data window

8. If you see the window in Figure 6, SimSinter is working properly and can properly open simulators. If you wish to continue this tutorial, and configure the simulation, please see the tutorial section of the SimSinter User Manual. It includes sections on configuring simulations for Aspen Custom Modeler, Aspen Plus, and Microsoft Excel.

4.2. Units Conversion Test

The Units Conversion Test is a simple test that tests the unit conversion abilities of SimSinter. It requires Microsoft Excel.
The Units Conversion Test has 3 variables that have units Celsius (degC), Fahrenheit (degF), and Kelvin (K). If the input file inputs values in a different temperature unit, that value will be converted to the correct one. The input and output variables are the same. So the output variables are just the input values converted to the correct units.
The inputs are:

in.boil.celsius: 212.0°F
in.boil.fahrenheit": 100.0°C
in.misc.kelvin: -273.15°C, 0.0°C, 100.0°C

The outputs should be:

in.boil.celsius: ~100°C
in.boil.fahrenheit": ~212°F
in.misc.kelvin: ~0.0K, ~273.15K, ~373.15K

1. Navigate to the C:\SimSinterFiles\Units_Test directory
2. Double click on the “runtest.bat” file. This will run the test.
   Note: Due to the fact that the installation directory changes, this batch file attempts two run commands. One should fail with “The system cannot find the path specified.” The other should say “Starting Run 0.”

3. The test should generate a new file: unitstest-outputs-test.json
4. Open unitstest-outputs-test.json and unitstest-outputs.json
5. These files should match aside from the file date. Alternately, you can just check that the input and outputs values in unitstest-outputs-test.json approximately match those given above.

5. INSTALLATION PROBLEMS

5.1. Known Issues/Fixes

There are no known installation issues.

5.2. Reporting Installation issues

If any issues are found with the installation, please contact:
ccsi-support@acceleratecarboncapture.org