



D-RM BUILDER INSTALLATION GUIDE

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1. INTRODUCTION

D-RM Builder is a software toolkit for generating dynamic reduced models (D-RMs) from high-fidelity dynamic models or transient experimental data. Currently it supports high-fidelity dynamic models in Aspen Custom Modeler (ACM) form. The program was written in C++ for CPU intensive calculations and Python for Graphic User Interface (GUI) using PySide libraries. Although the code can be compiled on both Windows and Linux platform, it requires another CCSI package named SimSinter, which is also a Windows program. For those users who are not interested in further development, a Microsoft software installer “DRMBuilderSetup.msi” is provided for the current version that can be installed on Windows platform (Windows 7 or higher). To launch ACM simulations from D-RM Builder, the user also needs to install Aspen Tech’s ACM program.

2. PREREQUISITES

2.1. Hardwad

A computer run on Windows operating system

2.2. Software

D-RM Builder is a software package to generate data-driven nonlinear dynamic models from high-fidelity ACM dynamic models or from experimental data of an existing plant. It has been tested on 32 bit and 64 bit windows platforms. The current version is compiled in 32-bit system, which can be installed on both 32 bit and 64 bit Windows operating systems.

2.2.1 Required third party software packages

For developers who are interested in future revision and enhancement of the software package, Microsoft Visual Studio (version 2012 or higher) and Python 2.7 are needed.

For end users who are not interested in modifying the source code, no computer language packages are needed. The installer will install binary executables and required libraries, along with examples and documents.

Note: For both developers and end users, Aspen Tech’s ACM software package (Version 8.6 or higher) needs to be installed along with another CCSI’s tool named SimSinter, which is used to run ACM dynamic simulations.

3. BASIC INSTALLATION

3.1. Third Party Software Installation

3.1.1 SimSinter Installation

Please follow the instructions of SimSinter to install the CCSI package.

3.1.2 Aspen Installation

Please follow Aspen Tech’s installation guide to install ACM version 8.6 or higher.

3.2. Product Build (For Developers Only)

Developers need to install Python 2.7 and Microsoft Visual Studio (version 2012) or higher on their Windows computer in order to compile and debug the program. Two Python packages including numpy and matplotlib also need to be installed.

There are two C++ projects in D-RM Builder, namely pyDRMSampling and pyDRMTraining. The two projects are compiled by Visual Studio to create two Python extension DLLs named “pyDRMSampling.pyd” and “pyDRMTraining.pyd” located in the “DLLs” folder. The two modules can be imported to Python code and called by passing a Python tuple as input parameter and returning a Python tuple as results.

To build two DLLs (pyd files), simply open the two corresponding Visual Studio solution files and run “Build Solution” command through the Visual Studio GUI. The DLLs are created in the “DLLs” folder.

The main program is written in Python with PySide for GUI. “main_dymbuiler.py” contains a main function which calls other Python code in “gui” and “framework” directories. Python’s py2exe library is used to create the binary distribution files. To create a distribution, run the following command in DOS prompt at the main source code directory:

```
Python setup.py py2exe
```

It will create a folder named “build” and a folder name “dist”. The files in the “dist” folder are the files that need to be installed on end user’s computer. The executable program to launch D-RM Builder is “main_drmbuilder.exe”. It is strongly recommended that those files be wrapped in an installer with user’s manual and examples in the “docs” and “examples” folders. The Microsoft installer file for the current version “DRMBuilderSetup.msi” is provided for this initial open source release.

3.3. Product Installation

For end users, simply run the provided Windows installer “DRMBuilderSetup.msi”. Follow the instructions of the installer to complete the installation process. It is required that the user accept the license agreement displayed in one of the dialog window. The user also has the option to install the program in a user specified directory. The default directory is “C:\Program Files (x86)\CCSI\DRMBuilder”. It also creates a shortcut on user’s desk top and adds the program to Windows’ “Start” menu.

4. INSTALLATION TEST

Simply click the shortcut on user’s desktop or Window’s start menu. When the D-RM Builder is run for the first time, it will create a configuration file “config.txt” in the “C:\ProgramData\CCIS\DRMBuilder” folder. The configuration file contains the full path of the SimSinter’s installation directory. If SimSinter is installed in its default direction at “C:\Program Files (x86)\CCSI\SimSinter”, the “config.txt” will be created automatically. Otherwise, the user needs to browse to SimSinster’s installation directory. If SimSinter is not installed, the user needs

The screenshot shows the D-RM Builder application window. The title bar reads "D-RM Builder". The menu bar contains "File", "View", "Setup", "Build", "Post-Process", "UQ", and "Help". The toolbar features a series of icons: a red cube, a blue folder, a yellow disk, a blue folder, a blue circular icon with a white waveform, left and right navigation arrows, two puzzle pieces, two play buttons, a gear, a building, a line graph, a 3D cube, a waveform, a warning triangle, and a blue question mark. The main workspace is a large white area.

5. INSTALLATION PROBLEMS

N/A

Contact ccsi-support@acceleratecarboncapture.org.

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