

DIRSIG 4.2

Installation Instructions for Mac OSX

The DIRSIG 4.2 software is released on the Mac OSX platform as a traditional Mac installer “package”. Simply double-click the package file and follow the standard directions to install it. DIRSIG 4.2 is built to run on Mac OSX 10.4 (Tiger) and 10.5 (Leopard).

The default install location for DIRSIG is in the **/Applications** folder. For the 4.2 release (and all updates), the programs and supporting data files will be in **/Applications/DIRSIG 4.2**. Any updates to this release (e.g. 4.2.1, 4.2.2, etc.) will upgrade the files by *replacing* them with newer versions. Therefore, you should make a copy of the installed files if you have made modifications to them **before** updating with a new release.

The main graphical user interface is in **/Applications/DIRSIG 4.2/bin** as **dirsig_edit**. The command line version of the model is in the same directory as **dirsig**.

1 Shell Setup

Since the 4.2 release, DIRSIG has been distributed with a graphical user interface that allows the user to configure and run a DIRSIG simulation without using any command line tools. However, there are still many reasons you might want to run a DIRSIG simulation from the command line. If you want to run DIRSIG from the command line (e.g. Terminal.app, xterm, etc.), then your login shell will need to have the path to the DIRSIG executables configured and the `DIRSIG_HOME` environment variable set. The default shell for most accounts on Mac OSX is bash, but many users use `csh` or `tcsh`. The automatic setup of environment variables in your login shell is slightly different for each shell, but the general requirements for each are the same. If you are a novice at setting up your shell environment, consult the documentation for the shell you are using or ask an experienced user or administrator.

- The `DIRSIG_HOME` environment variable must be set to point to the top of the installation directory. On the Mac OSX platform, the default installation directory is **/Applications/DIRSIG 4.2**.
- Add the DIRSIG executables directory to your path. The directory containing the DIRSIG executables is **/Applications/DIRSIG 4.2/bin**.

2 Finder Setup

In order for the the DIRSIG graphical user interface (`dirsig_edit`) to start from **Finder** (the main interface to the file system), the `DIRSIG_HOME` variable must also be set in a file that **Finder** reads when you log in. The file is `$HOME/.MacOSX/environment.plist` where `$HOME` is your home directory. This file does exist for most users and the easiest thing to do is to copy this file to your account.

Since **Finder** does not display files or directories that begin with a “.”, the easiest approach is to copy this file using command line tools. A copy of this file is located in the `config` subdirectory under the DIRSIG installation directory (`$DIRSIG_HOME/config/environment.plist`). You can copy this file into your account by performing the following steps:

- Start the **Terminal** application. This program can be found in **/Applications/Utilities** as **Terminal**.
- Create the `.MacOSX` directory in your home directory by typing the following command:
`mkdir ~/.MacOSX`
- Copy the provided `environment.plist` file to your account by typing the following command: `cp $DIRSIG_HOME/config/environment.plist ~/.MacOSX`

If you have performed this operation for a given previous release, then you do not need to repeat this process for subsequent updates to the release. For example, if you have setup the `environment.plist` file for 4.2.0, then you do not need to update it for 4.2.1, 4.2.2, etc.

3 MODTRAN Setup

3.1 Installing MODTRAN

Just like every other DIRSIG operating system platform, you need to have MODTRAN compiled and installed. Explaining how to compile and install MODTRAN is beyond the scope of this DIRSIG installation guide. New MODTRAN users are encouraged to read the documentation supplied with MODTRAN.

One of the common questions regarding MODTRAN on Mac OSX is “What Fortran compiler to use?” The primary compiler used by Apple and other developers for the OSX platform is the GNU Compiler (GCC). Although you can download and install XCode developer tools from Apple which contains the C, C++ and Java compilers in the GCC suite (e.g. gcc, g++, etc.), the GNU Fortran compiler (usually referred to as gfortran) is *not* included. However, several third-party groups make versions of gfortran available as installer packages using the same compiler source code that Apple uses.

The GCC suite we use at RIT is compiled and built by the “R Project” team at AT&T Research Labs. However, Google searches on gfortran for OSX will yield many sites that have the GNU Fortran compiler available for download. The AT&T group has native installer packages for GCC (including gfortran) available on their website:

<http://r.research.att.com/tools>

3.2 DIRSIG Configuration

In order for DIRSIG to use MODTRAN, DIRSIG must know where MODTRAN is compiled and installed. This is described to DIRSIG and supporting programs via the configuration file for the make_adb program (the primary tool that interacts with MODTRAN). This configuration file can be found in the config subdirectory under the DIRSIG installation directory. On the Mac platform, that file is `$DIRSIG_HOME/config/make_adb`. The contents of this file are shown below:

```
MAKE_ADB_CFG = 1.0
```

```
MODTRAN {  
    MODTRAN_EXE = /Applications/Mod4v3r1/Mod4v3r1.exe  
    MODTRAN_DATA_DIR = /Applications/Mod4v3r1/DATA  
    MODTRAN_MIN_DELTA = 1.0  
}
```

```
BACKGROUND_RADIANCE_FILE = /Applications/DIRSIG 4.2/lib/data/misc/star_light.dat
```

The key items to setup that might vary from installation to installation are the MODTRAN related items inside the MODTRAN section. In this example file, MODTRAN was compiled and installed into the /Applications/Mod4v3r1 directory, where Mod4v3r1 refers to MODTRAN4, version 3, release 1. However, MODTRAN can be compiled and installed in any directory.

The MODTRAN_EXE variable contains the path to the MODTRAN executable. The MODTRAN_DATA_DIR variable contains the path to the MODTRAN “data” directory that contains all the band model files, etc. The MODTRAN_MIN_DELTA variable contains the maximum spectral for this version of MODTRAN. The resolution limit for MODTRAN4 is 1 wavenumber (cm^{-1}) and for MODTRAN5 it is 0.1 wavenumber (cm^{-1}).