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EMA3D

version 3.1

Software Installation Guide

for Windows

EMA3D version 3.1.2 01-November-2007

EMA3D version 3.1 Software Installation Guide for Windows

C O N T E N T S

EMA And Software Information on the CD-ROM

In addition to the EMA3D software, the EMA3D CDROM also contains a number of documents, in several electronic formats, containing a variety of information about EMA, its various software products, software features and prices, consulting and other activities, and other information. Look in the "win\EMAandSoftwareInformation" folder on the CD-ROM.

EMA3D Installation Documentation

A copy of this document is also on the EMA3D CD, in the folder "win\installdocs".

Installing CADfix - Use the Correct CADfix Setup Type

EMA3D uses the software product CADfix as a graphical front-end. The installations of EMA3D and CADfix are separate. The two products may be installed in either order.

When installing CADfix, the user is usually presented with a choice of "Setup Type" to install. The choices are usually:

1: CADfix Data Exchange (or sometimes called "DX")
2: CADfix CAE Modeller
3: CADfix license manager only

Use "CADfix CAE Modeller" when installing CADfix for use with EMA3D. It is important to choose this Setup Type for use with EMA3D. The "Data Exchange" or "DX" setup type is for automated CAD database translation and repair and does not contain the interactive command-line functionality required for preparing a model for use with EMA3D. The "CADfix license manager only" option should be used if you want to install the CADfix license manager on a machine on which you do not wish to install CADfix.

Overall Procedure

The overall procedure for installing EMA3D is:

1) install the software - see section "Installing EMA3D"
2) install a license - see section "Setting Up Licensing"
3) locate the documentation - see section "EMA3D Documentation"
4) Additional Information:
   - see section "gnuplot" for more information about gnuplot, a free third-party plotting program included with EMA software.
   - see section "Adobe Acrobat Reader" for instructions on obtaining and installing Adobe Acrobat Reader if you do not already have Acrobat Reader on your system.
   - see section "Appendix A: EMA3D Environment Variables" for information about the environment variables used by EMA3D/CADfix.

Installing EMA3D

Perform the following steps to install EMA3D on Windows:

1) Log on as the Windows Administrator.
2) Load the EMA3D CD into the CD-ROM drive.
3) Using Windows Explorer, find the "win" folder on the CD, then navigate to the "ema3d" subfolder of that folder. Double-click on "Setup.exe" in the "win\ema3d" subfolder.
4) The installation program will guide you through the installation. You will be prompted for an installation directory. The default location is

   C:\ProgramFiles\EMA\EMA3D3.1.2

   At one stage of the installation, you will be prompted for the setup type. "Typical" is recommended.

   If you choose the "Custom" setup type, one of the choices you will have is whether to install the license server files. See the section of this Installation Guide, titled "Setting Up Licensing", for information on whether you should install the license server files. If you are unsure, or wish to decide later whether to use a license server, it is recommended that you install the license server files. They do not take up very much disk space, and they include tools that are useful for working with the software license key(s) you will be issued. You can decide later whether or not you will actually use the license server.

Runnning EMA3D

Running EMA3D

Unlike most Windows programs, EMA3D is command-line-oriented rather than window-oriented. This means that it is not run by clicking on an icon or a program shortcut. It is run by typing the name of the program at a Windows command prompt. The software program CADfix serves as a graphically-oriented, window-oriented, user-interactive front-end program for building/importing geometrical models and assigning properties for the EMA3D simulation. EMA3D itself, however, is a numerical solver that simply runs quietly for some period of time, performing computations based on information created within CADfix.

The general idea is to build or import a geometrical model within CADfix, assign properties for the electromagnetic numerical simulation (also within CADfix), then export all this data to an input file for EMA3D. EMA3D reads the input file and quietly runs until the computation is finished.

To run EMA3D, type the name of the program, "ema3d", at a Windows Command Prompt:

```
windows prompt> ema3d
```

If nothing happens, or if you get an error message like "The name specified is not recognized...", see "Appendix B: Windows PATH Environment Variable" near the end of this document.

EMA3D will prompt you for the name of an input file. You can give the input filename with or without the ".emin" extension (the file extension for EMA3D input files). If all the information in the input file is self-consistent and there are no errors, EMA3D will proceed with the computation. See the User Manual Set for EMA3D for detailed information about using EMA3D and CADfix.

You can also supply the input file name as a command-line argument:

```
windows prompt> ema3d testmodel.emin
```

EMA3D version

The exact version of EMA3D that is installed can be determined with the following command:

```
windows prompt> e3dver
```

It is a simple batch script that echoes the EMA3D version and date release.

This information can also be displayed from the following shortcut on the Start Menu:

Start Menu→Programs→EMA→EMA3D v3.1.2→About EMA3D

Running the EMA3D/CADfix interfaces

Traditionally, EMA3D has been accompanied by two interface programs that enable it to interoperate with CADfix: the program "famtoema3d", which translates geometrical information and EMA3D problem information from the CADfix model database file to the EMA3D input file format; and the program "famfromema3d", which translates simulation result data from the EMA3D output file format to a CADfix result database file.

In the current release of EMA3D, the function of "famtoema3d" is performed by a GUI tool within the CADfix GUI. To find this tool, select the toolbox named "EMA3D_ReviewTool" from the drop-down list of toolboxes in the CADfix GUI, and click the button "EMA3DREV". The "Model Review Tool" will open, displaying summary information about the EMA3D simulation data in the CADfix database. The button at the bottom labeled "FTE" performs the "famtoema3d" conversion.

The function of "famfromema3d" is still a separate, command-line program, which is run from a Windows command prompt:

```
windows prompt> famfromema3d
```

famfromema3d will prompt you for the name of an EMA3D output file. You can also supply the output file name as a command-line argument:

```
windows prompt> famfromema3d testmodel.emout
```

The EMA3D output file (*.emout file), and the corresponding CADfix database from which the model was build (*.fbm file), must both be in the current working directory to run famfromema3d.

> NOTE: CADfix was called "FAM", for "Field Analaysis Modeller" in earlier releases. The name "FAM" or "fam" still persists in some places. The naming convention "famfromanalysis" or "famtoanalysis" is still the standard convention for programs that translate information between CADfix and any analysis program.

famfromema3d for Different Versions of CADfix

famfromema3d is built using some CADfix executable code, and is therefore somewhat dependent on the version of CADfix being used for correct operation. The version of famfromema3d that is executed when you run "famfromema3d" as shown above, is built for CADfix 7.0. The EMA3D installation also includes versions of famfromema3d for CADfix 5.1, 6.0, and 7.0. These versions have names that indicate which version of CADfix they are built for, and can be executed as follows:

For CADfix 5.1, use the following:

```
windows prompt> famfromema3d510
```

For CADfix 6.0:

```
windows prompt> famfromema3d600
```

For CADfix 7.0, you can use the following:

```
windows prompt> famfromema3d700
```

Or, for CADfix 7.0 you can just use "famfromema3d" as indicated before. "famfromema3d" and "famfromema3d700" are two copies of the same program with different names.

EMA3D Documentation

The main EMA3D User Manual set can be accessed from the Start Menu. Look under Start Menu→Programs→EMA→EMA3D v3.1.2 for the shortcuts to the EMA3D Manuals in Adobe Portable Document Format.

Some documentation does not have a shortcut on the start menu and is accessed by going directly to its location on your computer. Here is a full listing of the user manuals and documentation that are part of the EMA3D software installation:

Installation Documentation

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docs\install_ema3d.pdf

- EMA3D Installation Guide for Windows (this document)

docs\install_ema3d.txt

-text file version of install_ema3d.pdf

EMA3D User Manual Set

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docs\EMA3DGettingStartedManual.pdf
docs\EMA3DOverviewManual.pdf
docs\EMA3DTrainingManual.pdf
docs\EMA3DProjectObjectivesManual.pdf
docs\EMA3DPreparationManual.pdf
docs\EMA3DReviewToolManual.pdf
docs\EMA3DExecutionManual.pdf
docs\EMA3DPostProcessingManual.pdf

- EMA3D User Manual Set

EMA3D tools/utilities documentation
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docs/ema3d_utilities_ref.pdf

- EMA3D Utilities Reference manual for the command-line utilities included with EMA3D (PDF format)

docs/ema3d_utilities.README

- list and overview of the command-line utilities

docs/addfiles.README
docs/derivfile.README
docs/fft.README
docs/filter.README
docs/makesource.README
docs/multisource.README
docs/shiftsource.README
docs/source.README
docs/source2.README
docs/sumfile.README
docs/tfunc.README
docs/writenode.README
docs/writeprobe.README
docs/xferNewSource.README

docs/compute_Pavail.README
docs/compute_Pin.README
docs/compute_Pout.README
docs/compute_Prefl.README
docs/compute_Skn.README
docs/compute_Snn.README
docs/compute_TrFn.README
docs/compute_Vin.README
docs/compute_Znn.README
docs/RCS.README
docs/RXS.README

- individual read-me files for each utility (text format) (same information as in the EMA3D Utilities Reference manual)

gnuplot documentation
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docs\gnuplot.pdf
- Gnuplot manual
docs\gpcard.pdf
- Gnuplot reference card
docs\tutorial\tutorial.pdf
- Gnuplot tutorial

Documentation for gnuplot is also available in the form of the help system within gnuplot after you start gnuplot.

Rainbow SLM license manager software (for system administrators)
---

lic\docs\SLM71sys.pdf
- Rainbow Sentinel License Manager System Administrator's Guide (for use by system administrators)

Files with a name like "README", "*.readme", "*.README" or "*.txt" are text files that may be viewed with any text file viewer.

Files with extension .pdf are Adobe Portable Document Format (PDF) files. They require Adobe Acrobat Reader to view them. To view these files, first launch Adobe Acrobat Reader, go the the "File" menu, "Open..." command and navigate to the location of the desired document.

If you do not have Adobe Acrobat Reader on your system, see the section "Adobe Acrobat Reader", below, or consult your system administrator.

EMA3D Utilities

EMA3D Utilities

Several command-line utilities, useful in working with data files produced by and used with EMA3D, are part of the EMA3D distribution. They are located in the "bin" folder of the EMA3D installation. You can run them from a command prompt the same way you run ema3d. For example,

```
windows prompt> writenode
```

EMA3D Utilities Documentation:

Documentation on the meaning and usage of the EMA3D utilities (command-line data-file utilities) is installed in the "docs" subdirectory of the EMA3D installation (default installation location shown):

C:\ProgramFiles\EMA\ema3d3.1.2\docs

The file "ema3d_utilities.README" contains a listing and top-level description of all of the utilities. Each utility also has its own README file, and all of them are documented in the EMA3D Utilities Reference Manual. See the section "EMA3D Documentation".

gnuplot

EMA3D result waveforms may be viewed with any available third-party plotting package. The freely-available "gnuplot" is fit for this purpose, and is included on the EMA3D software CD-ROM. Gnuplot may be installed either by the EMA software installation program along with the rest of the EMA software installation, or separately.

install gnuplot with EMA software installation

By default, gnuplot is installed automatically by the installation program. If you wish to not have gnuplot installed with the EMA software, choose the "Custom" installation type and un-check the gnuplot component.

The installation program adds the gnuplot "bin" folder to the value of the environment variable PATH, so that gnuplot may be run from a command line. The name of the program is "wgnuplot".

example:

```
windows prompt> wgnuplot
```

There will also be a shortcut on the Start Menu:

Start Menu→Programs→EMA→EMA3D v3.1.2→gnuplot 4.0.0

install gnuplot separately

gnuplot may be installed separately from the EMA software at any time. To install gnuplot separately, go the the "win\gnuplot4.0.0" folder of the CDROM, and unzip the file "gp400win32.zip" to some location on your hard drive. The location to which you unzip the .zip file will be the installation location for gnuplot; you can manually create shortcuts to "wgnuplot.exe" on your desktop or start menu if you wish.

disclaimer

Gnuplot is free, third-party software provided as a convenience to EMA software end-users in accordance with the Gnuplot Copyright. EMA does not support gnuplot; it is included "as-is" on the CD and in the EMA software installation.

See "Appendix E: Gnuplot Copyright" for the Gnuplot Copyright statement.

For more information on gnuplot, visit the main gnuplot web site at:

http://www.gnuplot.info

Adobe Acrobat Reader

Most of the manuals included with the EMA3D distribution are in Adobe Portable Document Format (PDF). Viewing them requires Adobe Acrobat Reader, which is available for free.

Acrobat Reader from Adobe

Acrobat Reader can be obtained from the Adobe web site at:

http://www.adobe.com

Acrobat Reader from the EMA3D CD

Acrobat Reader is included on the EMA3D CD for convenience. It is not installed by the installation script, but it can be installed separately if you do not have Adobe Acrobat Reader on your system. Look in the subfolder "win\acrobat" of the the CD-ROM. You will find a file named something like "AdbeRdr....exe" (the middle part of the filename will vary). Double-click on this file to begin the Acrobat Reader installation.

Setting Up Licensing

Licensing Overview

Software licensing for EMA software is managed by the Sentinel License Manager product, version 7.2, from Rainbow Technologies.

End-users of EMA software may choose between two basic types of licensing: a floating network license (also called a server license), or a standalone license. The type of licensing you wish to use will determine the type of license key you will request EMA, Inc. to issue. It also will determine whether you need to run the license server.

With a floating network license, the license server software is installed on one machine along with a floating network license key for the product(s) purchased. Users may use the EMA software product(s) on any machine with network access to the license server machine; the application checks out a license key from the server when it is run. Several machines can share the same license(s) up to the concurrent usage limit (number of licenses purchased).

With a standalone license, the license server is not used. A license key for the software product(s) purchased is installed on each individual machine, and the software application reads the license key directly. Each machine requires its own individual license.

After you have decided which type of licensing you wish to use, follow the instructions below. If you decide to use standalone licensing, you may skip the sections "License Server Installation" and "License Server Startup".

Obtaining and Installing a License - Overall Procedure

Use the following overall procedure to obtain and install a license for EMA3D.

1) install the license server if you are using floating network licensing
2) generate locking information for the license server machine (for network licensing) or for the individual machine(s) (for standalone licensing)
3) transmit the locking information to EMA
4) receive one or more license key files (usually by e-mail)
5) install the key file(s) in the correct location(s)

Follow the instructions below to perform each step of the procedure:

Step 1) License Server Installation and Startup (floating network license only)

License Server Installation (floating network license only):

If you wish to use a floating network type of license, you must install the license server on one machine of your choice. In the EMA3D installation program, if you chose the "Typical" setup type, or if you chose the "Custom" setup type and left the license-related installation components checked, the license server files are automatically installed in the subfolder "lic" of the EMA3D installation folder. If the machine on which you installed EMA3D is the machine on which you wish to run the license server, you need do nothing more to install the server.

If you wish to install the license server separately on a different machine from the machine(s) on which you have installed EMA software, or if you chose to not install the licensing-related files as part of the EMA software

installation, there is a separate setup program which can be used to install just the license server. To install the server, perform the following steps:

1) Log on as Windows Administrator and insert the EMA3D CDROM into your CDROM drive.
2) Using Windows Explorer, navigate to the following subfolder of the EMA3D CDROM:

   win\license\server\setup

   Double-click on "Setup.exe" and the installation program will guide you through the installation. When you are finished, re-start the computer.

License Server Startup (floating network license only)

Once the license server is installed on a machine, it must first be registered as a Windows service, and then started. The server is registered as a Windows service with the command "loadls.exe". "loadls.exe" is one of the files installed by the license server installation program. To register the server:

1) Log on as the Windows Administrator. Using Windows Explorer, locate the command "loadls.exe" under either the subfolder "lic" of the EMA software installation folder, or a separate directory where you installed just the license server software. Double-click on "loadls.exe" to launch it.
2) "loadls" will prompt you for the directory where the license server executable is. This will probably be the same directory as where "loadls.exe" is. The license server executable is "lservnt.exe". Double-check the location displayed under "Executable Path" in the "loadls" dialog box. When the path is correct, press "Add". "loadls" will register the server as a Windows Service. Quit the "loadls" program. (NOTE: When you press "Add" to register the service, you may get an error message titled "LoadLS", saying "Unable to add the SentinelLM system Service to the System Service Registry. Is the service already installed?" This is OK, and just means that the install program already registered and started the service. Press OK and press Cancel to quit the LoadLS program.)
3) The last step is to configure the startup of the license manager. Find the Services management application for managing Windows services (the location of this varies for different versions of Windows; consult your system administrator or contact EMA for assistance if you do not know where to find this). Find "SentinelLM" in the list of services, and double-click on it to display the startup-configuration dialog. Choose "automatic" or "manual" startup type as desired. "Automatic" is recommended as this will start the license server service whenever the machine boots. If you choose "manual", you will have to manually start the server either from the "Services" applet, or from a command prompt using the Windows "net start" command, after each time you reboot the computer. Click "OK" to dismiss the dialog box, then close the Services management application.

Step 2 & 3) Obtain machine locking codes and transmit them to EMA

Machine Locking Codes (Fingerprinting):

In order to obtain a license or licenses for the software you have purchased, you will need to obtain some machine locking codes for the machine on which the license server will run (in the case of network licensing), or the machine(s) on which the EMA software will run (in the case of standalone

licensing). This is done with the utility "echoid", which is part of the Rainbow licensing software.

If you have installed all the licensing tools along with the EMA software (the default choice), there will be the following shortcut on the Start Menu for this utility.:

Start Menu --> Programs --> EMA --> EMA3D v3.1.2 --> Show Machine ID (for licensing)

Find this shortcut and click on it to display the "Locking Codes" for your machine.

If this shortcut does not exist on the Start Menu, you can run "echoid" by locating it in the "lic" folder of the EMA3D installation on your hard drive, if you have installed the licensing tools (the default choice). Use Windows Explorer to navigate to the "lic" folder of the EMA3D installation, and double-click on "echoid.exe" to run it and display the "Locking Codes" for your machine.

example output from "echoid":

```
Lock Code 1       4-213D4
Lock Code 2       10-4E7DD
```

If you have not installed the licensing tools, or if you need to use "echoid" on a machine on which you have not yet installed EMA3D or the licensing software, "echoid" can also be run directly from the EMA3D CDROM. Use Windows Explorer to navigate to the following subdirectory of the CDROM:

win\license\tools

Find "echoid.exe", and double-click on it to display the "Locking Codes" for your machine.

For network licensing, obtain the locking code(s) for the machine on which you are running the license server. For standalone licensing, obtain the locking code(s) for each individual machine on which you will run the EMA software application. "echoid.exe" must be run on each machine for which you need a locking code.

When you have obtained the "Locking Codes" for your machine(s), transmit the information to EMA and EMA will issue license keys based on those locking codes.

NOTE: When running "echoid", the file "echoid.dat" MUST be in the current working directory in order to generate the correct locking codes! This will be true if you run "echoid" as described, either from the start menu shortcut or by navigating to its location using Windows Explorer.

Step 4 & 5) Receive and install license key file(s)

License Key File Installation:

You will be issued one or more license codes to activate the EMA software you have purchased. Each license code is an alphanumeric string, usually e-mailed as an ASCII text license key file. When you receive a license key file, save it as (or save a copy of it as) a text file named "lservrc" (no file

extension). Where you place the key file depends on whether you are using network or standalone licensing.

For standalone licensing, place the key file "lservrc" in the "bin" folder of the EMA3D installation. This folder will be "C:\ProgramFiles\EMA\EMA3D3.1.2\bin", the same folder containing the EMA3D executable program files. EMA3D will find the license key file when it runs by looking in the same directory where it lives. Do this on each machine on which EMA3D is installed and for which you have been issued a license.

For network licensing, place the file "lservrc" in the "lic" folder of the EMA3D installation. This folder will be "C:\ProgramFiles\EMA\EMA3D3.1.2\lic", the same folder containing the license server executable program and other license manager files. If you are installing a new license key file, you must stop and re-start the license server (from the Control Panel→Services applet) to pick up the new keys.

If you already have a network license key file named "lservrc" containing licenses for other EMA products, or for products from other vendors using the Sentinel License Manager license server, append the contents of the new key file to the existing file instead of replacing it.

License Key File Format

The format of the license key file is important in order for the EMA software or license server to successfully read it. License keys issued by EMA will be in the correct format when they are sent. However, if the format becomes altered or if you experience trouble, the following are the important points to observe:

- Every line in the file consists of a license code string, optionally followed by a comment. A '#' denotes the beginning of a comment.
- There should be exactly one license code string in each line of the file.
- Every line in the file must begin with a license code string and not some other text, not even a comment.
- The permissions of the file must be set so that the users (in the case of standalone licensing) or the license server (in the case of network licensing) have permission to read it.

Documentation:

For more detailed information about the Sentinel License Manager, refer to the "Sentinel License Manager System Administrator's Guide". A copy of the guide is included on the EMA software CDROM in Adobe Acrobat format, under the subdirectory:

win\license\docs

The file is named "SLM71sys.pdf". A copy of the guide is also installed in the "lic\docs" folder of the EMA software installation, if you choose a "Typical" setup type when you install the EMA software, or if you choose "Custom" and choose to install the "License Documentation" installation component.

Appendix A: EMA3D Environment Variables

EMA3D is tied together with CADfix through several environment variables. These are set automatically by the installation program. However, if you experience trouble with environment variables, the following is a list and description of the required EMA3D environment variables, and their required values. Symptoms of trouble with EMA3D environment variables may include: EMA3D CADfix GUI toolboxes or tools not appearing under the drop-down list of toolboxes in the CADfix GUI; EMA3D macros not being found when you try to invoke them from CADfix (either from a tool button or by name from the CADfix command-prompt); a TCL error to the effect of "unknown command" or "command not found" when you try to launch an EMA3D CADfix GUI tool.

Here is a list of the necessary environment variables and their required values.

Variable	Meaning and required value
CADFIXSITECONFIG	Conveys to CADfix the location of the custom site-level CADfix configuration file, named "CADfix", which contains the definitions of the EMA-provided CADfix toolboxes and tool buttons which should appear in the CADfix GUI. Typical value: C:\ProgramFiles\EMA\EMA3D3.1.2\FAMmacros
FAMMACROPATH	Conveys to CADfix the location of the custom EMA macros invokable from within CADfix either by name, or (for some macros) from a tool button inside an EMA toolbox. Typical value: C:\ProgramFiles\EMA\EMA3D3.1.2\FAMmacros
EMATCL	Conveys to CADfix the location of TCL source files that implement the functionality of some of the EMA CADfix GUI tools that appear in some of the EMA toolboxes within CADfix. Typical value: C:/ProgramFiles/EMA/EMA3D3.1.2/TCLsrc IMPORTANT NOTE: the value of this particular environment variable must contain forward-slashes, as shown, not backwards-slashes like a typical Windows directory pathname. This is due to the way CADfix parses this particular environment variable. Forward-slashes are necessary for the value of the EMATCL environment variable only, other environment variables can use the typical Windows backwards-slash.

EMABITMAPS

Conveys to some of the EMA CADfix GUI tools, the location of bitmaps which are displayed for illustrative purposes in some of the EMA CADfix GUI tool dialog boxes.

Typical value:

C:\ProgramFiles\EMA\EMA3D3.1.2\TCLsrc

Additional environment variables not related to CADfix:

Variable	Meaning and required value

PATH

Conveys to the system, the locations of directories in which to look for executable programs invoked from the command line.

Typical values added by installation program:

C:\ProgramFiles\EMA\EMA3D3.1.2\bin
C:\ProgramFiles\EMA\EMA3D3.1.2\gp400win32\gnuplot\bin

Appendix B: Windows PATH Environment Variable

Unlike most Windows programs, EMA3D is command-line oriented rather than window-oriented. This means that EMA3D and its utilities are used by typing the name of a program at a Windows Command Prompt, rather than opening the program by clicking on an icon on the Windows Start Menu or Desktop. When you run a program by typing its name at a command prompt, Windows must have a way to find the location of the program in order to run it. This is accomplished through the Windows environment variable called PATH. PATH contains a list of folders, which are the locations of programs that a user might want to run from the command prompt.

When you install EMA3D using the automatic installation program, the installation program adds the name of the EMA3D "bin" folder to the PATH environment variable. The "bin" folder is where the EMA3D executable files are located.

If you get an error message saying something like "The name specified is not recognized..." when you try to run EMA3D as instructed in the section "Running EMA3D", this probably means the installation program was not able to add the EMA3D "bin" folder to the value of PATH. (If you get an error message from EMA3D indicating that there is not a valid license installed, this is a different error and only means that you must install a license key.) If this happens, you can manually add the EMA3D "bin" folder to the value of PATH.

The typical location of the "bin" folder will be something like:

C:\ProgramFiles\EMA\EMA3D3.1.2\bin

The installation program also adds the gnuplot "bin" folder to PATH. This is typically:

C:\ProgramFiles\EMA\EMA3D3.1.2\gp400win32\gnuplot\bin

The procedure for editing environment variables varies from one version of Windows to another, so instructions are not included here. Consult your Windows documentation or system administrator, or contact EMA Inc. for assistance.

IMPORTANT NOTE: It is important to remember that you should only ADD one folder path name to the value of PATH. DO NOT REPLACE OR DELETE ANY EXISTING VALUE OF PATH! If you do you will harm your system configuration. Just ADD one folder path name to the value of PATH, separated from the rest of the list of values by a semicolon (;).

Appendix C: Platform Compatibility & System Requirements

The following are the system requirements for EMA3D version 3.1 for Windows. Please note that these are the system requirements for EMA3D only. CADfix (a separate software package that serves as a graphical front- and back-end to EMA3D) has its own system requirements that are separate from those listed below for EMA3D. Consult the CADfix Installation Guide for system requirements for CADfix.

Hardware Platform:

processor:	Intel x86-family processor or compatible
hard disk space (installation):	150 MB
hard disk space (user)*:	1 GB minimum, 5 GB or more recommended
system memory**:	256MB minimum, 500MB - 2 GB recommended
swap file size:	appropriately proportional to system memory (for example, 100% to 150% of system memory size is one commonly used rule of thumb)
graphics card/display:	no graphics card or display requirement

Software Platform:

operating system:	Windows NT4SP6a, 2000 or XP.
graphics system:	no graphics requirement

*User disk space requirements vary significantly depending on the amount of input and output data required for a particular EMA3D problem (input/output data file size), and the amount of space required for associated data files that may be produced in the course of pre- or post-simulation analysis. In fact, input and output data file size can vary for the same problem depending on length of simulation, number of output probes and time-spacing of output data points, and many other factors. Since disk space is rather cheap, a good rule of thumb is "the more, the better".

**System memory requirements vary significantly depending on what types of problems you want to solve with EMA3D. The memory image size of a particular EMA3D problem is affected by many, many factors related to the nature of the problem and how you are solving it. There is technically no upper limit to the possible memory image size of an EMA3D problem, while some useful EMA3D problems can be solved with only a few kilobytes of memory. Experience and familiarity with the software will, over time, give you a feel for how much memory you need to solve your problems of interest; there are no other strict requirements. The requirements mentioned are very rough guidelines only, and should allow you to solve a variety of useful EMA3D problems.

Please note that these are memory requirement suggestions for the EMA3D problem memory image size by itself, and does not include memory required by the operating system. For best performance, additional memory should be allowed for the operating system and/or other applications or system software.

Appendix D: CADfix Compatibility

EMA3D version 3.1 is designed for use with CADfix versions 5.1, 6.0 and 7.0.

CADfix is a product of Transcendata Europe Ltd.

Appendix E: Gnuplot Copyright

Gnuplot is distributed with EMA software in accordance with the Gnuplot Copyright, quoted here:

GNUPLOT v4.0.0 COPYRIGHT

```
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```