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# **SigFit**

## **Installation Manual**

### **Version 2017R1**

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January 27, 2017

Sigmadyne, Inc.  
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Rochester, NY 14611  
[www.sigmadyne.com](http://www.sigmadyne.com)

**Warning:** Use of this program is subject to the terms of the Demo Software Agreement or the Software Agreement agreed upon in writing with the User's authorized representative(s). Installation of this software indicates acceptance of the Software Agreement.

### Technical Support

IMPORTANT: When contacting technical support please provide the following:

1. Your .sig file defining your SigFit analysis.
2. All files referenced by the .sig file. This includes FEA model files, FEA results files, OLOAD files, VECTOR files, etc.
3. The nature of the problem and the error you are seeing, if any.

### Licensing Issues

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For more information about Sigmadyne visit our website at: [www.sigmadyne.com](http://www.sigmadyne.com).

The background theory used in SigFit is discussed in the following book & short courses:

Doyle, K., Genberg, V., Michels, G., **Integrated Optomechanical Analysis, Second Edition**, SPIE Press, November, 2012.

**Integrated Optomechanical Analysis** short course available from Sigmadyne, Inc.

**SigFit** short course available from Sigmadyne, Inc.

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# 1 Installation and Uninstallation

## 1.1 Upgrading the SigFit Applications

To upgrade SigFit from any SigFit version, simply follow the installation instructions in Section 1.3. The installer will automatically detect and optionally uninstall prior installations of SigFit.

## 1.2 Installation Requirements

Installation of SigFit requires Administrator permissions.

SigFit requires installation of Microsoft Visual C++ 2005 Redistributable SP1 with the latest security updates, Microsoft Visual C++ 2008 Redistributable SP1 with the latest security updates, and Microsoft Visual C++ 2012 Redistributable Update 4. The installer will install these redistributables automatically if the specific versions are not already installed.

SigFit has been tested on the following platforms:

Microsoft Windows XP on Intel x86\_32  
Microsoft Windows XP on Intel x86\_64  
Microsoft Windows Vista on Intel x86\_32  
Microsoft Windows Vista on Intel x86\_64  
Microsoft Windows 7 on Intel x86\_32  
Microsoft Windows 7 on Intel x86\_64  
Microsoft Windows 8 on Intel x86\_64  
Microsoft Windows 10 on Intel x86\_64

SigFit help files are accessible from VSigFit or by the shortcuts in the Start menu require Adobe Reader.

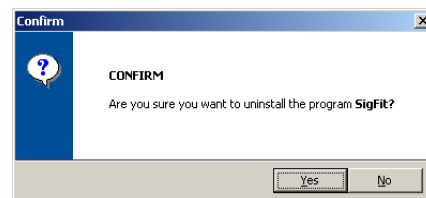
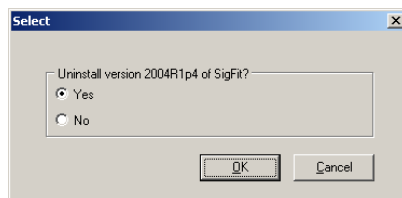
## 1.3 Installation of the SigFit Application

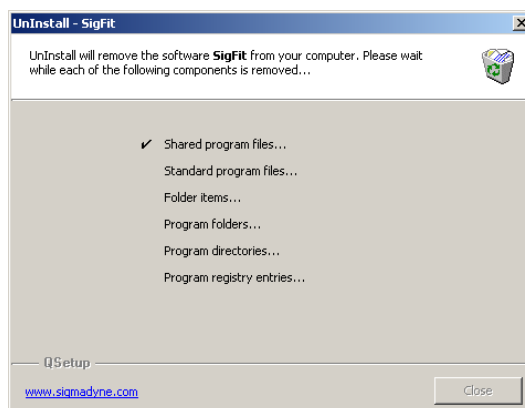
**WARNING:** Installation of this software indicates your acceptance of the license agreement supplied with the software.

The following steps will install SigFit and Visual SigFit as well as setting the appropriate environment variables. These steps must be performed on any machine on which the SigFit applications will be executed. Download SigFit2017R1\_x86\_32.exe or SigFit2017R1\_x86\_64.exe from the Sigmadyne website using the username and password provided by Sigmadyne. To begin, double-click SigFit2017R1\_x86\_32.exe or SigFit2017R1\_x86\_64.exe and follow the instructions.

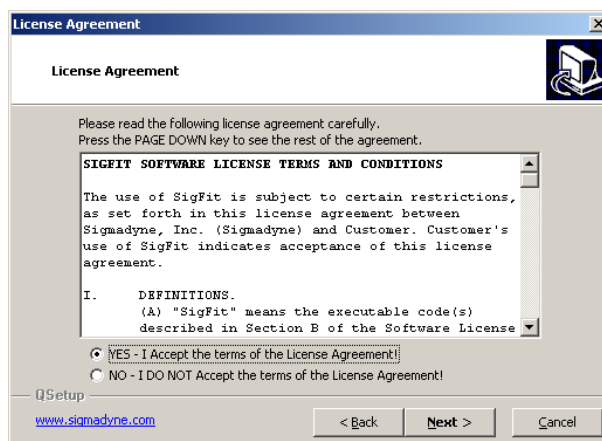
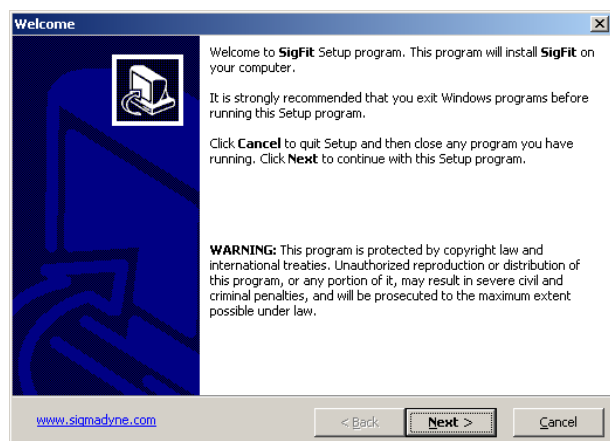
**IMPORTANT:** During the install process, some popup dialogs requiring a response may become hidden behind the main dialog window. If the install appears to be hung, simply move the displayed window(s) around to see if a dialog is present requiring a response. It is very common for the final dialog of the uninstallation of prior security device drivers to be displayed behind Uninstall – SigFit dialog.

A check for an existing installation is made. If a prior version is found, the user may request the installer to uninstall it.

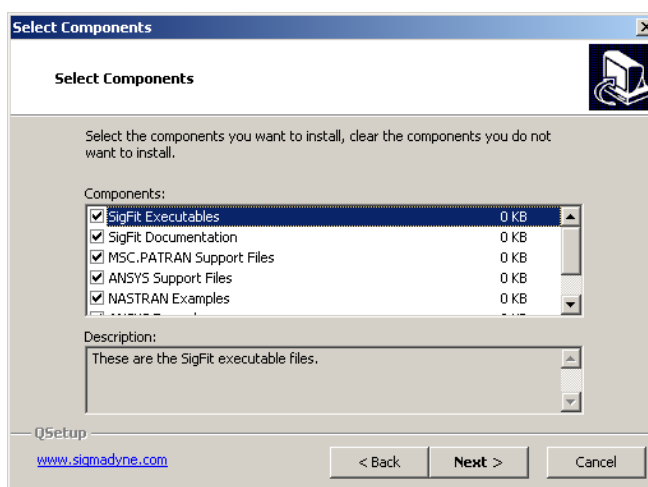




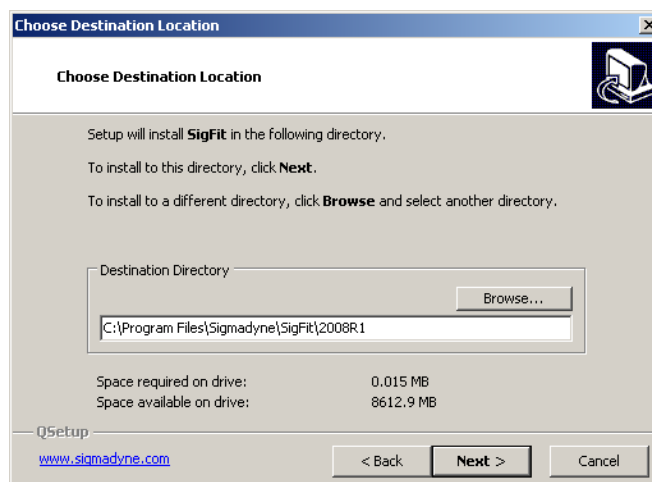
Once any detected prior installations have been removed, a Welcome banner will appear. Close any programs you may have running and pick Next. Read the License Agreement and indicate your acceptance by picking the radio button next to “YES” and pick Next.



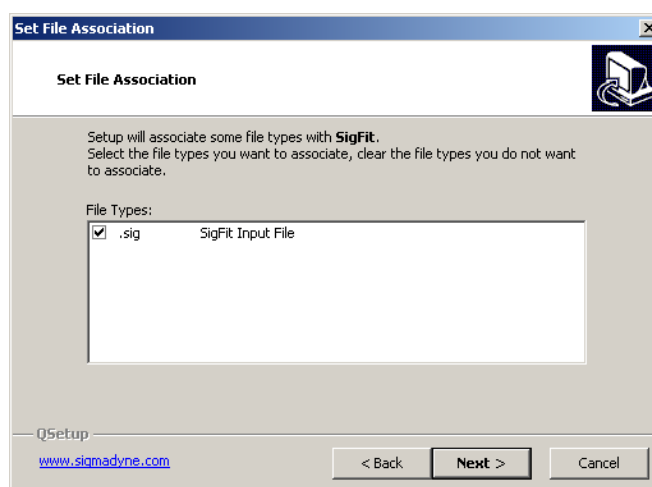
The Select Components dialogue as shown below can be used to choose which files to install. Select the files groups you wish to install and pick Next. The default installation is to install all files and is recommended.



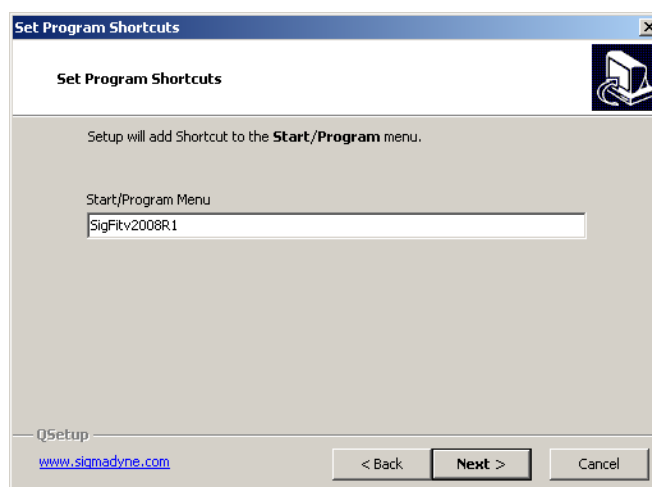
Use the default installation directory or modify it and pick Next.



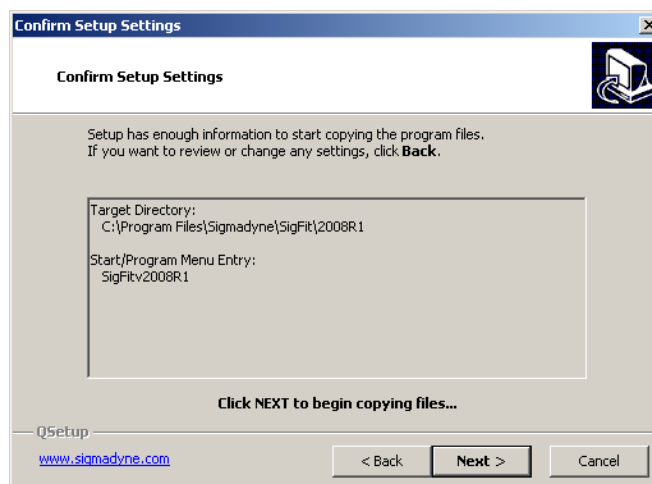
Choose if you would like .sig files associated with SigFit.



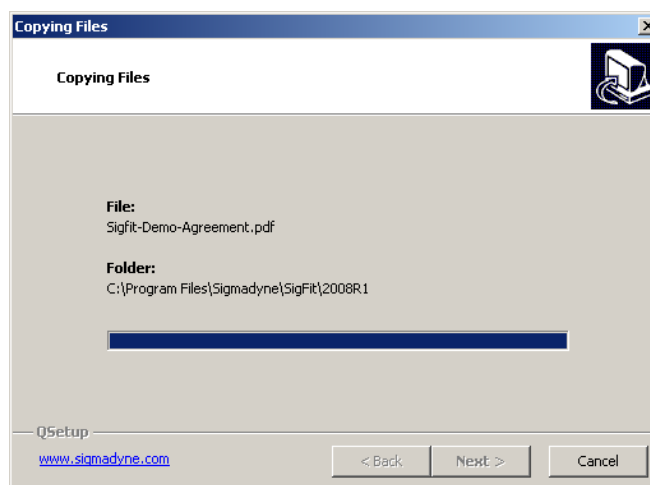
Use the default program folder name or modify it and pick Next.



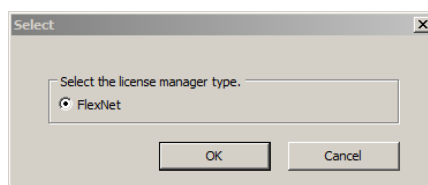
Verify the installation settings and pick Next.



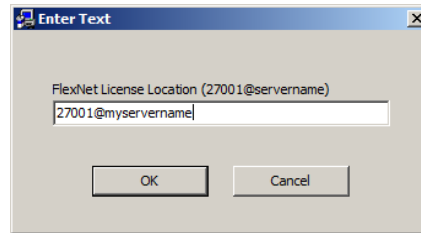
The selected files will copy to the installation directory.



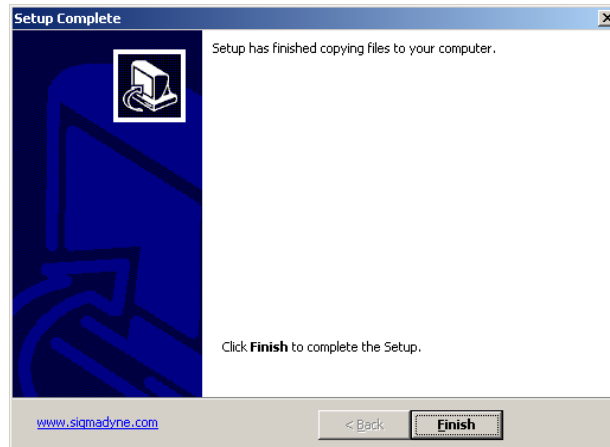
Once the files are copied a choice will be given to select the type of licensing system SigFit should expect to use. The license type chosen here will be stored in the system environment variable `SIGFIT_LICENSE_TYPE`.



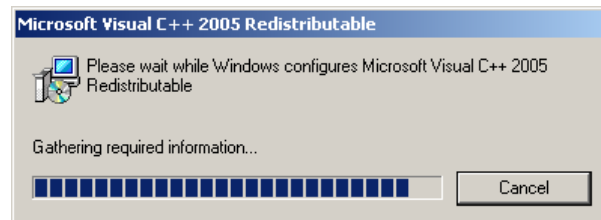
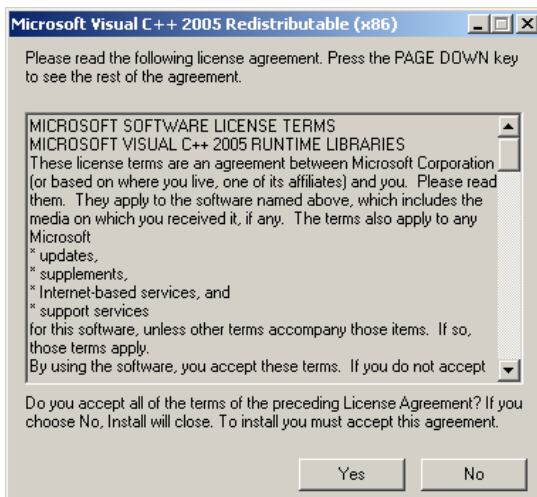
If the FLEXnet licensing system is chosen then the location of the FLEXnet license will be required. This location is given in the form of *port\_number@servername*. The port number may be chosen by the user but must be consistent with that used in the FLEXnet license file. Be sure that the port number chosen does not conflict with any other ports being used on your system. The license location specified here will be stored in the system environment variable `SIGMADYN_LICENSE_FILE`.



When the copy is complete pick Finish.

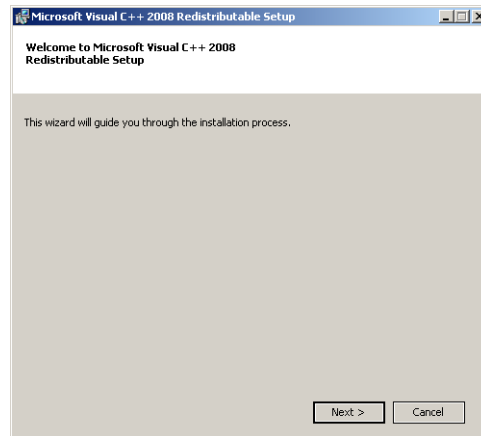


Installation of the Microsoft Visual C++ Redistributables will begin only if the versions used by SigFit are not already installed on your machine. Pick Yes to install the Microsoft Visual C++ 2005 Redistributable if the following dialog appears.

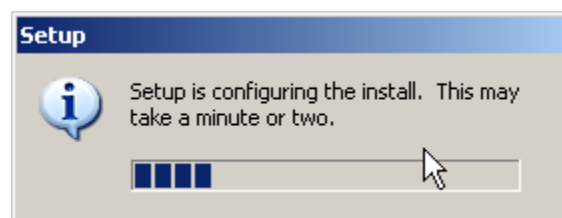
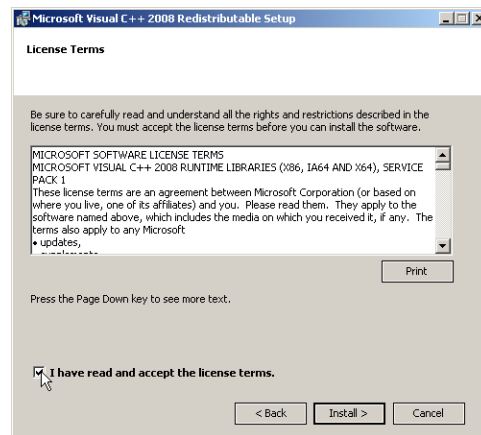


Pick Next to install the Microsoft Visual C++ 2008 Redistributable.

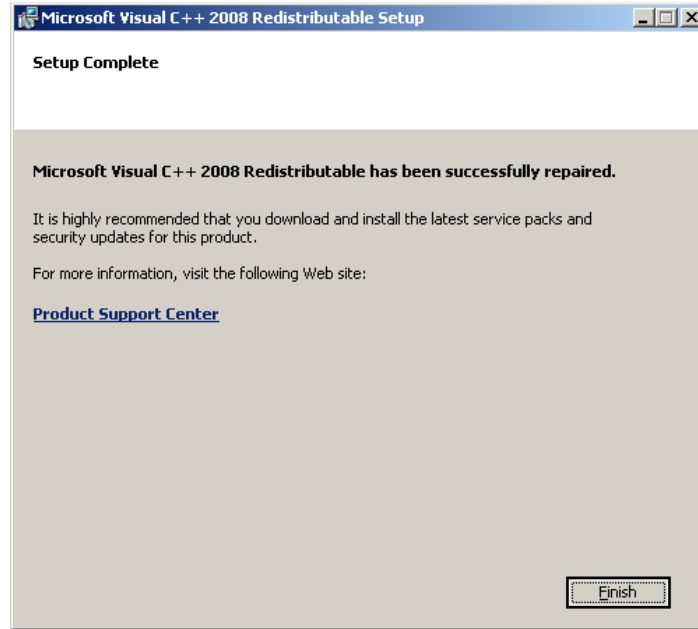




If the Microsoft Visual C++ 2008 Redistributable is not already installed then the following window will appear. Check the box and pick Install. The redistributable package will install.



Pick Finish to complete the installation.



At this point the installation of the SigFit application is complete and the installation will close.

### 1.3.1 Changing the License Environment Variables of an Existing SigFit Client Installation

If you would like to change the license type of an existing SigFit client installation make the changes as shown in the table below.

1. Be sure the system environment variable SIGFIT\_LICENSE\_TYPE is set to FLEXNET.
2. Edit the system environment variable SIGMADYN\_LICENSE\_FILE and set it to the location of the FLEXnet license in the form of *port\_number@servername*.

### 1.3.2 Customization of Registry Entries

For users who wish to create a remote installation of SigFit on a server for use by client users there are registry entries that must be setup to point to library folder used by SigFit. Registry creation files are provided in the folder Registry\_Support in the SigFit installation directory. Before executing these registry files on a client machine the string <InstallDir> must be replaced with the network path to the SigFit server installation folder.

### 1.3.3 Installation of the MSC PATRAN Plotting Template Files

The MSC PATRAN template files for making plots of SigFit results within MSC PATRAN can be found in the MSCPatran\_Support folder of the SigFit install directory. You may copy these files to a convenient location in the res\_templates folder in the MSC PATRAN install directory. It is suggested that any customized templates be placed in a subfolder such as {*MSC PATRAN install*}\res\_templates\Custom. This will allow easier browsing of the SigFit template files rather than browsing amidst the more than 60 templates in the res\_templates folder level.

### 1.3.4 Installation of the Macro Files for ANSYS Mechanical APDL

In ANSYS Mechanical APDL the user may choose to use either the macro file *sigout.mac*, *sigout\_select.mac*, or the library file *sigfit\_library.lib*. To install the macro users should perform one and ONLY one of the following steps to make the macro file visible to ANSYS Mechanical APDL.

1. Place the macro file *sigout.mac* and *sigout\_select.mac* in a directory location automatically visible to ANSYS Mechanical APDL. This may be the APDL macro directory (C:\Program Files\ANSYS Inc\v110\ANSYS\APDL in version 11.0), the user home directory, or, an alternate location which will be searched by ANSYS. Consult the ANSYS documentation for additional information relating to the placement of macro files so that they are visible to ANSYS Mechanical APDL.

- Place the macro library file, `sigfit_library.lib`, in a suitable location and use the `*ULIB` command to load the library file. A `*ULIB` command to load the macro library may be placed in the ANSYS start-up file (`start110.ans` for version 11.0). An example of this startup file is located in the ANSYS APDL directory (`C:\Program Files\ANSYS Inc\v110\ANSYS\APDL` in version 11.0). This command would look as follows:

```
*ULIB,{path}\sigfit_library.lib
```

where, *{path}* is the path to the *sigfit\_library.lib* file.

### 1.3.5 Installation of the Macro File for ANSYS Workbench

In ANSYS Workbench the user must use the library file *sigfit\_library.lib*. It should be placed in the ANSYS APDL directory (`C:\Program Files\ANSYS Inc\v110\ANSYS\APDL` in version 11.0, `C:\Program Files\ANSYS Inc\v121\ANSYS\APDL` in version 12.1, etc.).

### 1.3.6 Installation of the ABAQUS ODB API Library

The SigFit interface to ABAQUS requires use of the ODB API library supplied by SIMULIA in addition to a call to ABAQUS itself. Therefore, users must have ODB API library and ABAQUS installed on the machine on which SigFit is to run. Users must download the ODB API library archive from SIMULIA's website at [http://ftp.simulia.com/CDimages/ODB\\_API](http://ftp.simulia.com/CDimages/ODB_API). At this site select the version for which you would like to download. Then select either the *win86\_32* or *win86\_64* archive depending on your platform. After downloading the archive, extract the *lib* folder and place it in the ABAQUS installation path for the corresponding ABAQUS version. Generally, this is `C:\SIMULIA\Abaqus\{version}`. The interface file to SigFit will automatically be installed when the SigFit application is installed.

### 1.3.7 Installation of the CODEV User Defined Gradient Index Lens DLL

In order to use the results files generated by SigFit with the thermo-optic user-defined gradient index lens feature, the DLL files supplied with SigFit must be placed in the CODEV UMR directory generally located at *{CODEV installation folder}\umr*. It is important for the user to note that only versions of CODEV 10.6 and later are suitable for use with this feature. The DLL files supplied with SigFit can be found in the `CODEV_Support` folder in the SigFit installation path.

### 1.3.8 Installation of the ZEMAX User Defined Surfaces

In order to use the result files generated by SigFit for the surface types and fitting polynomial types shown in the table below, the listed DLL files must be copied into `C:\Program Files\Zemax\DLL\Surfaces` or `C:\Program Files\Zemax OpticStudio\DLL\Surfaces`. DLL files may be found in `C:\Program Files\Sigmadyne\SigFit\{version}\ZEMAX_Support`.

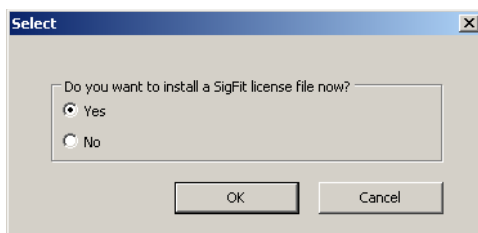
Surface Type	Fitting Polynomial Type	User Defined Surface DLL
Anamorphic	Standard Zernike	<code>sigfit_anamr_szrn.dll</code>

## 1.4 Installation of Sigmadyne FLEXnet Licensing

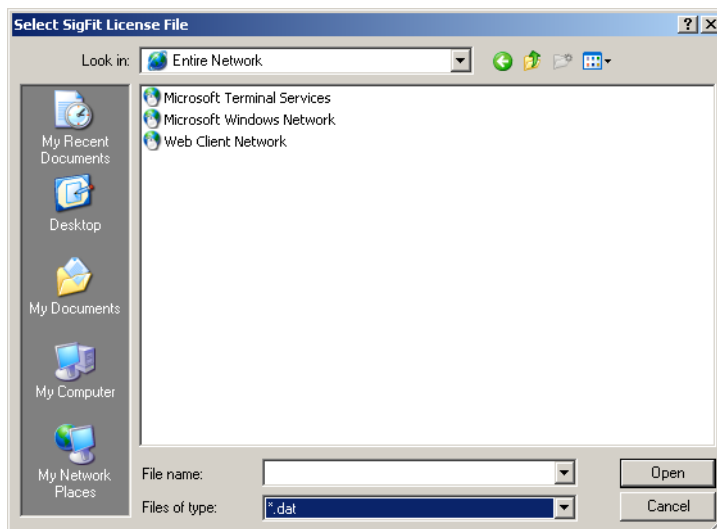
**WARNING:** It has been found that x86\_32 platforms can have trouble obtaining licenses from x86\_64 platform FLEXnet license servers. If you would like to use SigFit on any x86\_32 platforms be sure to install your FLEXnet server on a x86\_32 platform.

Sigmadyne FLEXnet licensing is installed on the license server only by double-clicking `SigmadyneFNPLicensingv11.4.1_x86_32.exe` or `SigmadyneFNPLicensingv11.4.1_x86_64.exe`. If you have a license certificate file for a specific license server machine, then be sure to install the license server software on that machine. No licensing software is required on client SigFit installations for Sigmadyne FLEXnet licensing.

Follow the instructions of the installation dialogs. You will be given a choice to install a license file.



If you answer yes, then you will be prompted to pick a license file which will be installed and used to start the FLEXnet service named Sigmadyne License Manager.



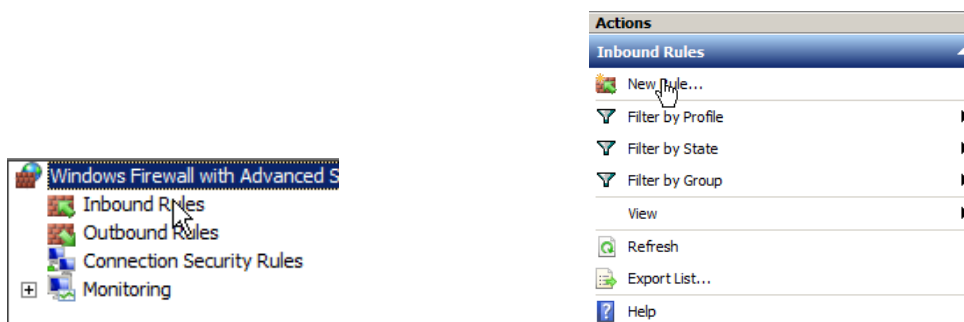
This will complete installation of the FLEXnet licensing software. To further configure the FLEXnet license manager use the Imtools utility found in Start/SigmadyneFNPLicensingv11.4.1.

#### 1.4.1 Firewalls and Sigmadyne FLEXnet Licensing

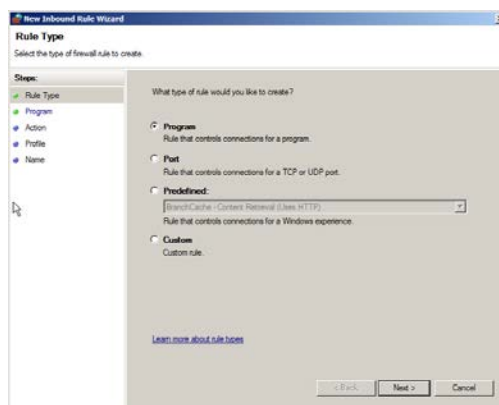
Two rules must be added to the license server machine if a firewall is used on the license server machine. The instructions below apply to the Windows Firewall in Windows 7. Add rules similar to those described below for other firewall software. Open the Control Panel from the Start menu. If the icons are displayed by Category then pick System and Security and then pick Windows Firewall. If all icons are shown then simply pick Windows Firewall. Pick Advanced Settings as shown below.



Pick Inbound Rules and then under Actions pick New Rule...



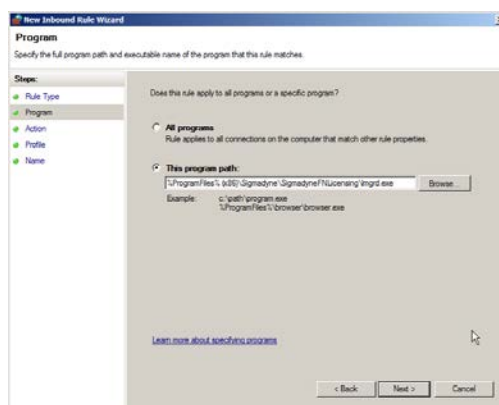
Select Program for the Rule Type as shown below. Pick Next.



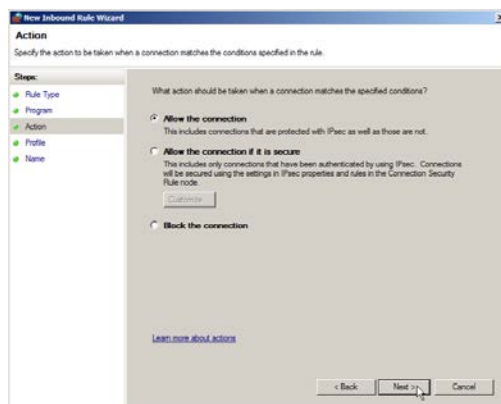
For the program path browse to the location of lmgrd.exe located in the platform dependent location specified in the table below.

Platform	Path to lmgrd.exe and SIGMADYN.exe
32 Bit Windows	C:\Program Files\Sigmadyne\SigmadyneFNLicensing
64 Bit Windows	C:\Program Files (x86)\Sigmadyne\SigmadyneFNLicensing

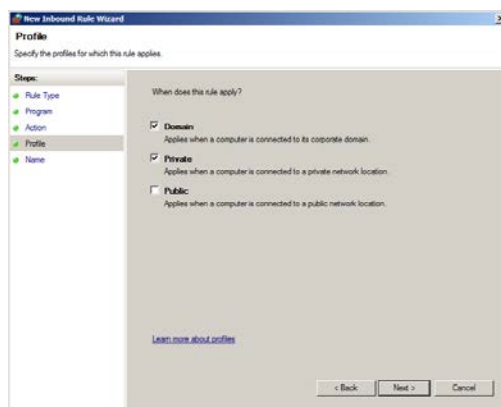
Pick Next.



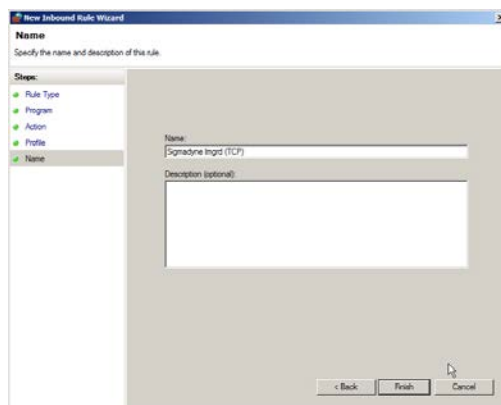
For the Action specify to Allow the connection. Pick Next.



For the Profile it is probably not necessary for your network to allow Public access so that can be unchecked. Pick Next.



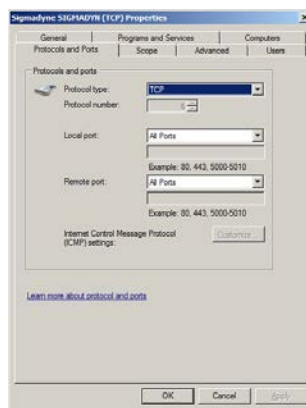
Specify a rule name of Sigmadyne Imgrd (TCP) and pick Finish.



After the rule is created double-click the rule shown in the Inbound Rule list. In the Protocols and Ports tab select TCP for the Protocol type. Specify the Local port to be the Specific Port of 27001 or whatever port number is used in the license file. Pick OK.



A second inbound rule should be added in a similar fashion to allow SIGMADYN.exe to pass TCP traffic on any port number. It is important that any port be allowed for SIGMADYN.exe as the port number may change if the license manager service is restarted and is not the port number specified in the license file.



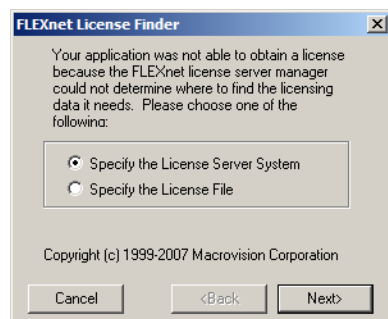
## 1.5 Uninstallation of the SigFit Application

SigFit may be uninstalled by the remove program feature in the Control Panel.

1. Double-click the Control Panel in My Computer.
2. Double-click the Add/Remove Programs icon.
3. Pick SigFit from the list and then pick Remove.
4. Pick Close after the uninstallation is complete.

## 1.6 Troubleshooting the FLEXnet Licensing System

If SigFit fails to access the license the following dialog will appear.



Do not attempt to specify the license through this dialog. If you get this dialog it means the license is inaccessible and the reason for this needs to be determined before attempting to run SigFit. Hit Cancel and follow the instructions below.

### 1.6.1 Quick Things to Check

There are a few common causes for failure to find a license as listed below.

1. **Installation of License Server Software:** When installing SigFit for the first time there are two pieces of software to be installed. The SigFit application is installed on all client machines and the licensing software is installed on the license server. Please be sure that you have followed the steps in Section 1.4.
2. **Restart License Server for W7 OS and Later:** On newer operating systems such as Windows 7 and later the licensing service may only start with a restart of the machine. Try restarting the license server machine and then rerunning SigFit.
3. **Allow Communication Through Firewalls:** The licensing system uses TCP/IP to communicate and can be blocked by firewalls. Please be sure to follow the instructions in Section 1.4.1.

### 1.6.2 Accessing the Debug Log File

The licensing system writes a debug log file on the license server machine. This log file is often helpful in understanding why the license is not obtained when running SigFit. The debug log file is located in one of the path locations shown in the table below.

Architecture of License Server Machine	Debug Log File Location
32 bit	C:\Program Files\Sigmadyne\SigmadyneFNLicensing\debug.log
64 bit	C:\Program Files (x86)\Sigmadyne\SigmadyneFNLicensing\debug.log

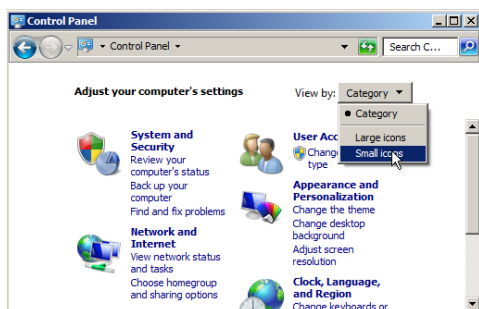
Please check with your IT department for permission to send this file to Sigmadyne and then send the file to [michels@sigmadyne.com](mailto:michels@sigmadyne.com). You may want to wait for Sigmadyne to advise what steps to take next or you may continue with troubleshooting as described below.

### 1.6.3 Determining if the License Service is Running

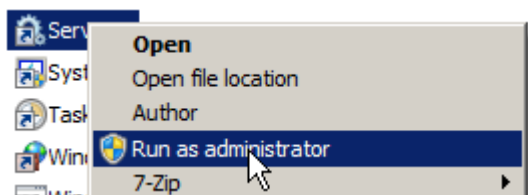
The next step in troubleshooting licensing issues is to understand if the service that serves the license is running on the license server machine. To perform these steps you will need access to the desktop of the license server machine and administrative privileges.

1. Open the Windows Control Panel and be sure you are viewing the contents by Small Icon or Large Icon, not by Category.

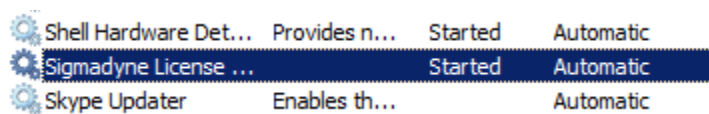




- Pick the Administrative Tools icon and then right-click Services and pick Run as Administrator to view the services running on the machine with administrator privileges.



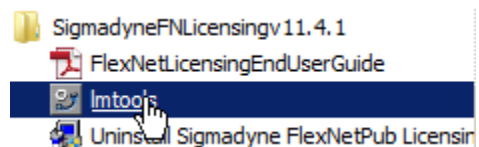
- Scan down the list with the scroll bar and look for “Sigmadyne License Manager.” The Status should be Started or Running and the Startup Type should be Automatic.



- If the status is blank then select the service in the list and pick Action/Start.
- If the service does not start then try restarting the license server machine.
- Report to Sigmadyne the results of these steps.

#### 1.6.4 Checking the License Server Status in LMTOOLS

This step is of no utility unless the “Sigmadyne License Manager” service is running as illustrated in the previous subsection. If the licensing service is running then the next step in troubleshooting licensing issues is to check the status in LMTOOLS. LMTOOLS may be launched from the SigmadyneFNLicensingv11.4.1 program group under the Start menu as shown below.



- On the Service/License File tab be sure that Sigmadyne License Manager is selected and that “LMTOOLS ignores license file path environment variables” is checked.
- On the Server Status tab pick Perform Status Enquiry. If the license is accessible then the output should look something like the below. If the license is accessible then the highlighted regions should be present. If these contents are present and the client SigFit application still fails to obtain a valid license then it is most likely that there is a firewall block between the client SigFit application and the license server

```
-----
Status
-----
Flexible License Manager status on Wed 5/6/2015 10:48

[Detecting lmgrd processes...]
```

```

License server status: 27001@pop-64
License file(s) on pop-64: C:\Program Files (x86)\Sigmadyne\SigmadyneFNLicensing\license.dat:

pop-64: license server UP (MASTER) v11.4

Vendor daemon status (on pop-64):

SIGMADYN: UP v11.4
Feature usage info:

Users of SIGFIT_STANDARD: (Total of 1 license issued; Total of 0 licenses in use)

Users of SIGFIT_ADAPTIVE: (Total of 1 license issued; Total of 0 licenses in use)

Users of SIGFIT_DYNAMICS: (Total of 1 license issued; Total of 0 licenses in use)

Users of SIGFIT_DESOPTQON: (Total of 1 license issued; Total of 0 licenses in use)

Users of SIGFIT_DNDT_DNDS_BIRE: (Total of 1 license issued; Total of 0 licenses in use)

```

3. If the status inquiry fails then output will be something like that shown below.

```

-----
Status
-----
Flexible License Manager status on Wed 5/6/2015 11:04

[Detecting lmgrd processes...]
License server status: 27001@pop-64
License file(s) on pop-64: C:\Program Files (x86)\Sigmadyne\SigmadyneFNLicensing\license.dat:

lmgrd is not running: Cannot connect to license server system.
The license server manager (lmgrd) has not been started yet,
the wrong port@host or license file is being used, or the
port or hostname in the license file has been changed.
Server name: 192.168.0.53
License path: 27001@pop-64;
FLEXnet Licensing error:-15,10. System Error: 10061 "WinSock: Connection refused"
For further information, refer to the FLEXnet Licensing End User Guide,
available at "www.macrovision.com".

```

4. Please report the results of the above to Sigmadyne.

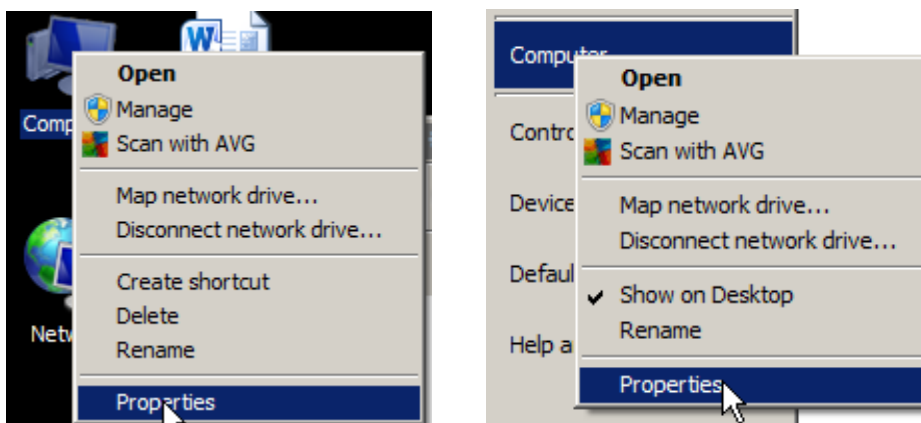
#### 1.6.5 Checking the Environment Variables on the SigFit Client Machine

The SigFit application uses two system environment variables in order to obtain a license. The environment variables are described in the table below.

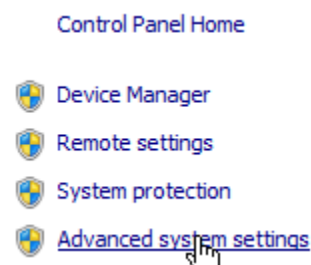
System Environment Variable	Value	Notes
SIGFIT_LICENSE_TYPE	FLEXNET	This value is used verbatim.
SIGMADYN_LICENSE_FILE	<i>port_number@servername</i>	<i>port_number</i> is the TCP/IP port number specified in the license file for communication. The default is 27001. You may optionally change the port number in the license file but it must be consistent with this setting on the client machine(s).  <i>servername</i> is the network name of the license server machine. Obtain this name from your IT staff.

You may verify the values of the environment variables by following the steps below.

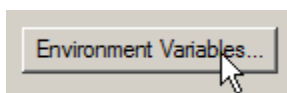
1. Right-click the Computer icon on your desktop or in the Start menu and pick Properties.



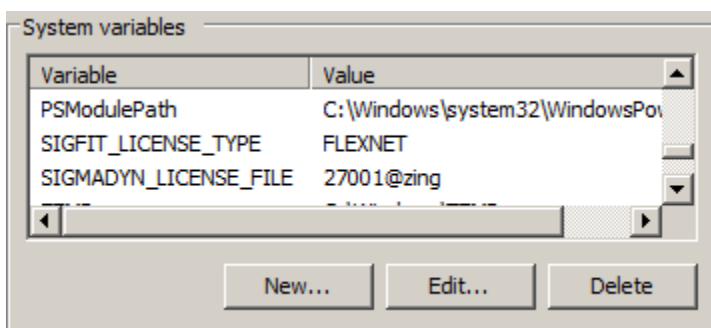
2. On the left-hand side pick “Advanced system settings.”



3. At the bottom of the pop-up window pick Environment Variables...



4. Under System Variables scroll down to the variables SIGFIT\_LICENSE\_TYPE and SIGMADYN\_LICENSE\_FILE. Check that the settings are as intended.



5. If the values are not as intended they may be edited by double clicking the variable in the list.