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SigFit

Installation Manual
SigFit 2020R1l
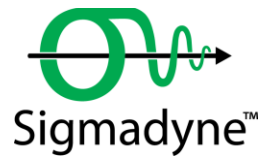
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December 8, 2022

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: 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 the most recent prior installation of SigFit. Note that SigFit 2020R1 and later use a new version of the license server software. Please be sure to upgrade your license server software to 11.17.0.0 with the installer SigmadyneFNPLicensingv11.17.0.0_x86_64.exe. You may use the same license file as you are using for the current license server software.
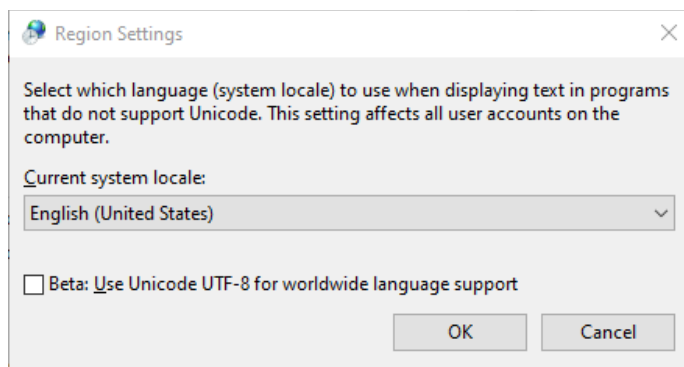
1.2   Installation Requirements

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 10 on Intel x86_64

Be sure that "Beta: Use Unicode UTF-8 for worldwide language support" is not checked. Some machines have been found to ship with this option checked. Checking this box results in a segmentation fault in a library call from wxPython to a Windows library when VSigFit is started. You can find this option in Settings > Time & Language > Administrative language settings (upper right under Related settings) > Change system locale.

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.

1.3.1   Installation of the SigFit Application Using the Installer GUI

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 SigFit2020R1l_x86_64.exe from the Sigmadyne website using the username and password provided by Sigmadyne. To begin, double-click SigFit2020R1l_x86_64.exe and follow the instructions.

IMPORTANT: Please verify that you see a message indicating that the software you are installing is by Sigmadyne, Inc. as a verified publisher. If Sigmadyne, Inc. is not shown as a verified publisher, then cancel the installation and contact Sigmadyne.

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.
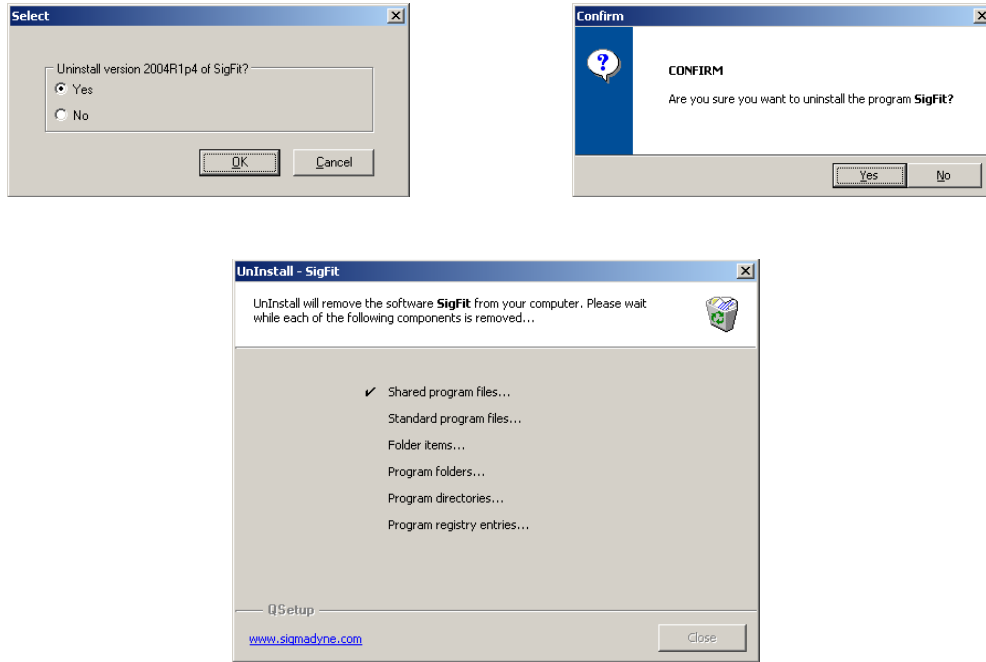
Once any detected prior installations have been removed, a Welcome banner will appear. Close any programs you may have running and pick Next. Read the License Agreement and indicate your acceptance by picking the radio button next to "YES" and pick Next.
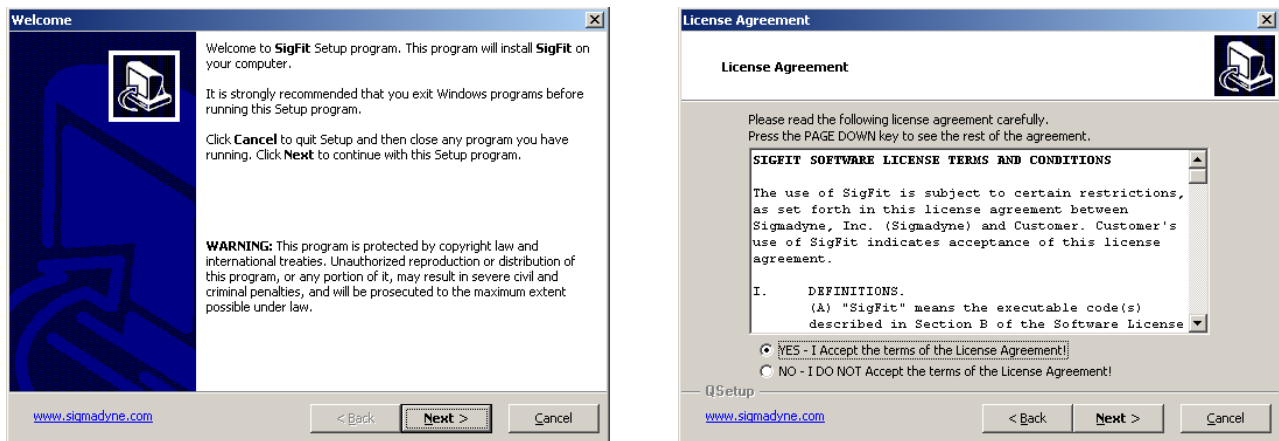
The Select Components dialogue as shown below can be used to choose which files to install. Select the files groups you wish to install and pick Next. The default installation is to install all files and is recommended.
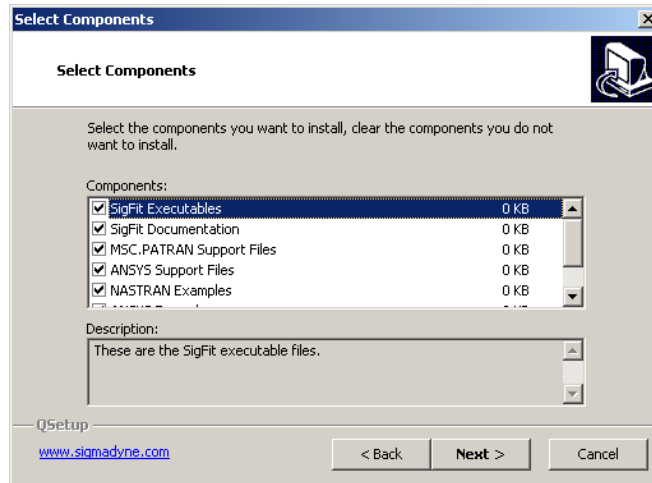
Use the default installation directory or modify it and pick Next.
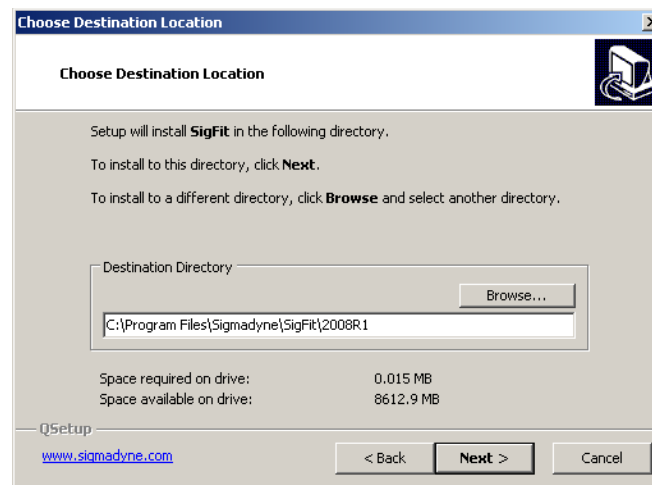
Choose if you would like .sig files associated with SigFit.
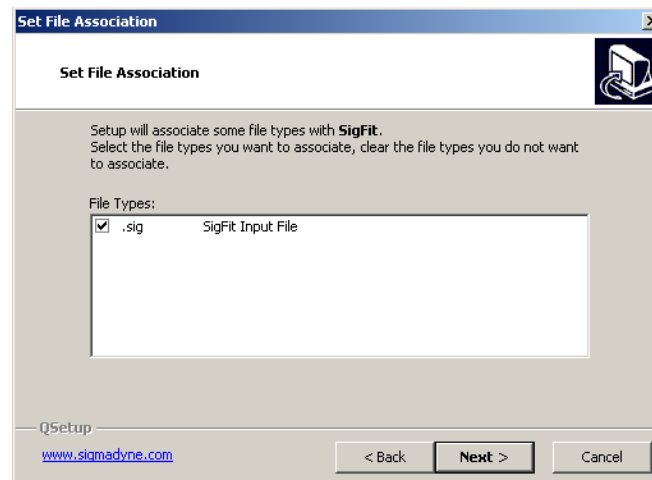
Use the default program folder name or modify it and pick Next.

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.

A message may appear emphasizing the importance of entering the license location on the next dialog. If you ignore this message and do not specify the corre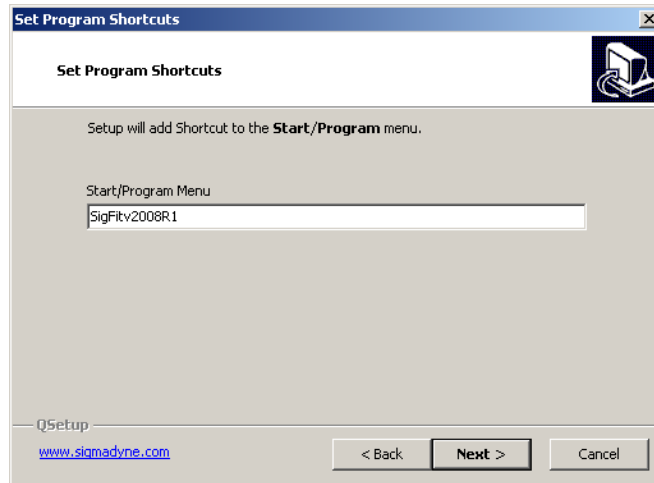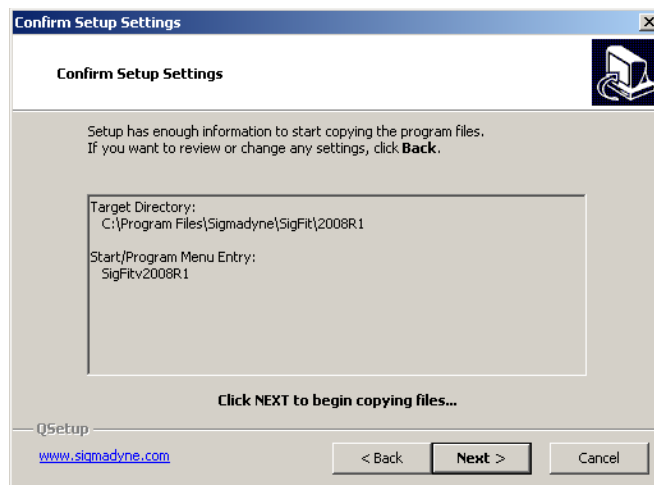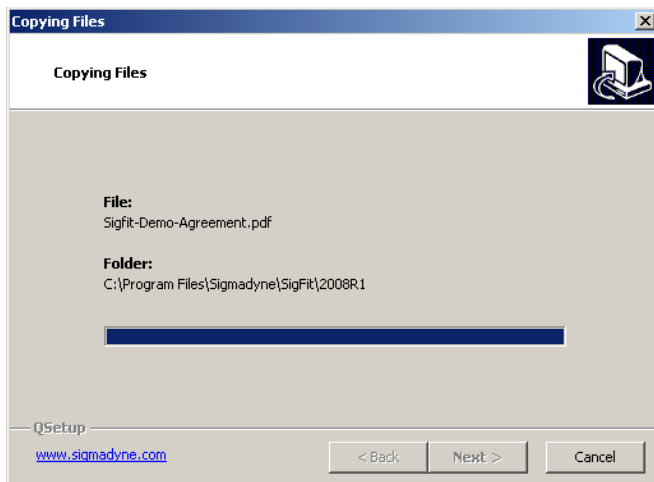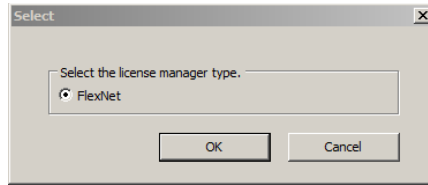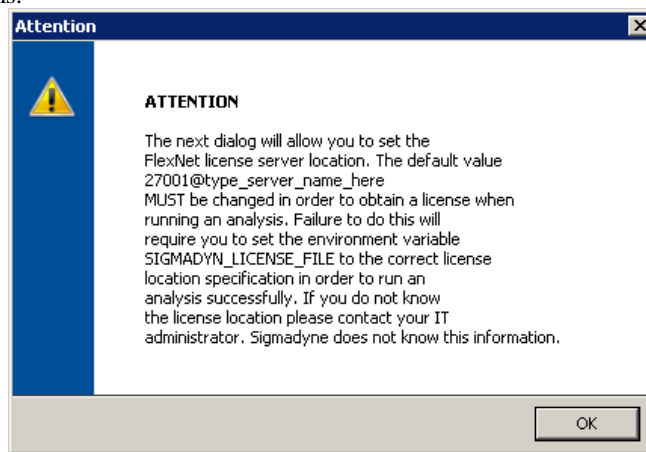ct license server location on the following dialog, please do not expect SigFit to obtain a license when running an analysis.

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@myservername*. 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. Please be sure to specify the netowork name of the license server machine in place of myservername or whatever default character string is displayed after the @ symbol. Failure to properly specify the TCP/IP port and the network name of the license server will cause SigFit to fail when an analysis is performed. The license location specified here will be stored in the system environment variable SIGMADYN_LICENSE_FILE and may be edited there.

Please do NOT ignore this setting. SigFit will NOT run analyses without a correct license location. If you do not know the setting please ask your IT administrator.
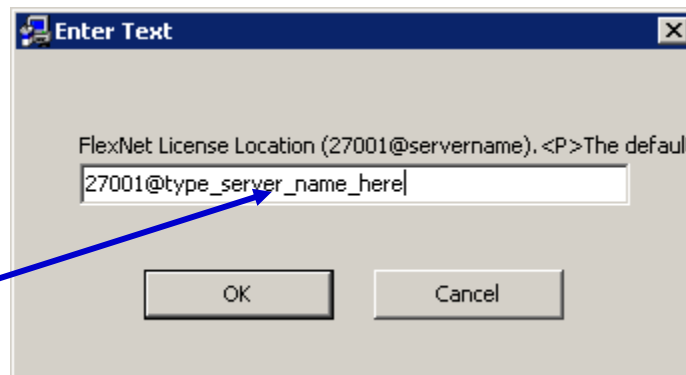
When the copy is complete pick Finish.
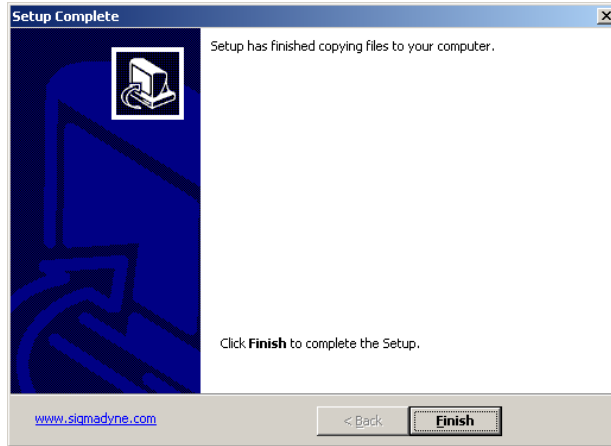
Installation of the Microsoft Visual C++ Redistributables will begin only if the versions used by SigFit are not already installed on your machine. Pick Yes to install the Microsoft Visual C++ 2005 Redistributable if the following dialog appears.
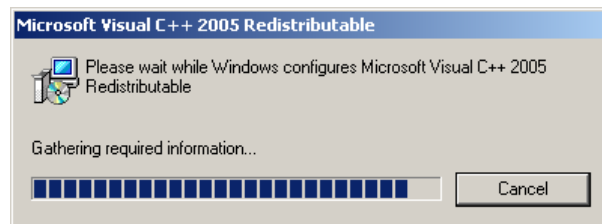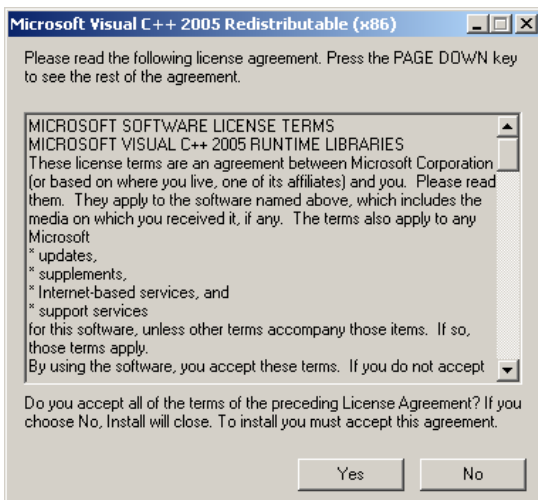
Pick Next to install the Microsoft Visual C++ 2008 Redistributable.
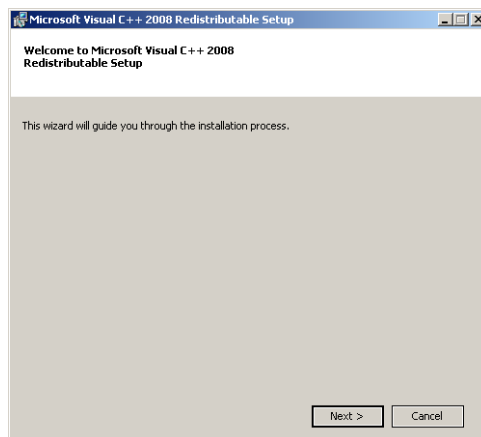
If the Microsoft Visual C++ 2008 Redistributable is not already installed then the following window will appear. Check the box and pick Install. The redistributable package will install.
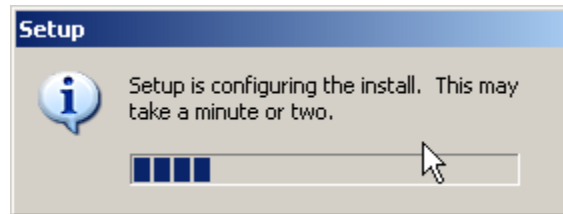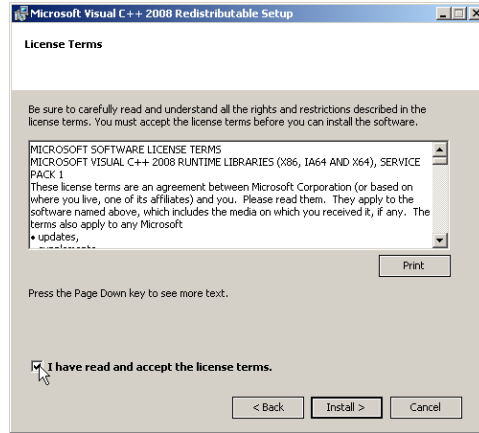
Pick Finish to complete the installation.
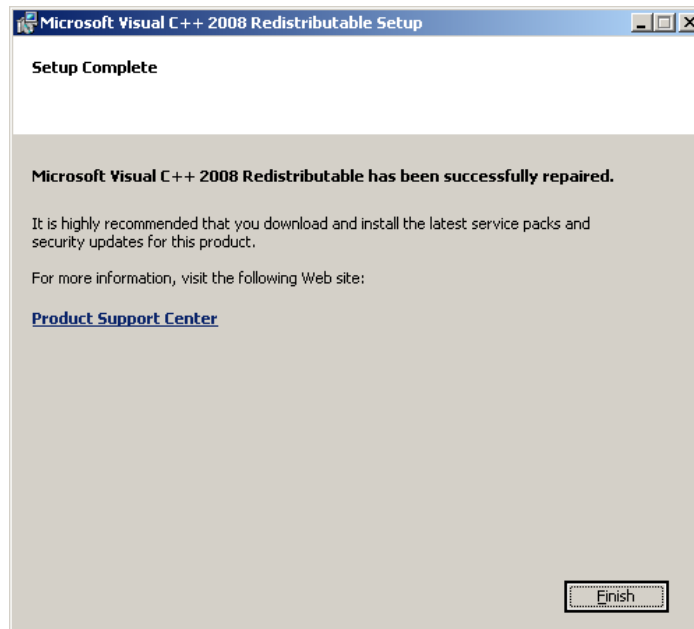
At this point the installation of the SigFit application is complete and the installation will close.

1.3.2   Installation of the SigFit Application Using the Command Line

The SigFit application may be installed by using command line operation by invoking the installer .exe filename from the command line with optional arguments for automated deployment. The optional arguments are as follows:

Option	Purpose
/Silent	No interaction with the user will be used. Installer will not uninstall prior version. Note fully silent operation requires use of /[SilentHide]=y as shown below.

/Hide	Installation will happen in the background with no status of progress shown. Note fully hidden operation requires use of /[SilentHide]=y as shown below.
/[SilentHide]=y	Custom dialogs for setting license information will be skipped. User will be required to set these setting manually. Please see subsections below. If you are unsure of using this feature please use the graphical interface method.
/InstallDir="Desination Directory"	Specification of the install directory. The default location is C:\Program Files\ Sigmadyne\SigFit\{version}.

For fully silent and hidden installation be sure to use the following option combinations. Note the use of [] is very important.

/Silent /Hide /[SilentHide]=y

1.3.3   Changing the License Environment Variables of an Existing SigFit Client Installation

If you would like to change the license location 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*. If you do not know this information please contact your IT administrator.

1.3.4   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 on the client machine to point to the network 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.

1.3.5   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.

1.3.6   Installation of the Macro Files for ANSYS Mechanical APDL and ANSYS Workbench

For use with ANSYS Mechanical APDL and ANSYS Workbench macro files shipped with SigFit must be installed in the ANSYS APDL directory. The ANSYS macro files can be found in the ANSYS_Support folder of the SigFit install directory. Place the macro files *sigout.mac*, *sigout_select.mac*, and *sigfit_library.lib* in a directory location automatically visible to ANSYS. 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.

1.3.7   Installation of the CSV Plot Extension for ANSYS Workbench

Users wishing to graphically plot in ANSYS Workbench results from SigFit will need to download and install an ACT extension available from the ANSYS AppStore.

1. Browse to https://catalog.ansys.com/ and search for "CSV Plot".
2. Download the CSV Plot application archive and extract the contents to your hard drive.
3. Open ANSYS Workbench and pick Extensions and Install Extension
4. Browse to the location of the extension wbex file in the bin folder of the archive you extracted and pick Open
5. Pick OK for the confirmation message

Please note that each time you start ANSYS Workbench you will need to load the installed extension.

1. Pick Extensions and Manage Extension.

2.   Check the box next to CSV Plot to load the extension.

The next time you start ANSYS Mechanical you will be able to create CSV plots of SigFit results as described in the Tutorial examples.

1.3.8   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. In current versions of ABAQUS the ODB library is installed automatically and SigFit is coded to find it as long as the user has selected the proper version of ABAQUS in the Solution or Parameter modules of SigFit.

1.3.9   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. Note that this DLL can change between versions of SigFit so be sure to update it when upgrading SigFit.

1.3.10   Installation of the ZEMAX 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 ZEMAX DLL directory generally located at C:\Program Files\Zemax\DLL\Surfaces, C:\Program Files\Zemax OpticStudio\DLL\Surfaces, or *{User_Documents}*\Zemax\DLL\Surfaces. Later versions of ZEMAX do not allow the use of the DLL/Surfaces folder in the Program Files installation path. Consult the ZEMAX user documentation for the correct installation location of the user defined surface DLLS files. The DLL files supplied with SigFit can be found in the ZEMAX_Support\UserGRIN folder in the SigFit installation path. Note that this DLL can change between versions of SigFit so be sure to update it when upgrading SigFit.

1.3.11   Installation of the ZEMAX User Defined Surfaces DLL

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 the ZEMAX_Support\Surfaces folder in the SigFit installation path.

Surface Type	Fitting Polynomial Type	User Defined Surface DLL
Anamorphic	Standard Zernike	sigfit_anamr_szrn.dll

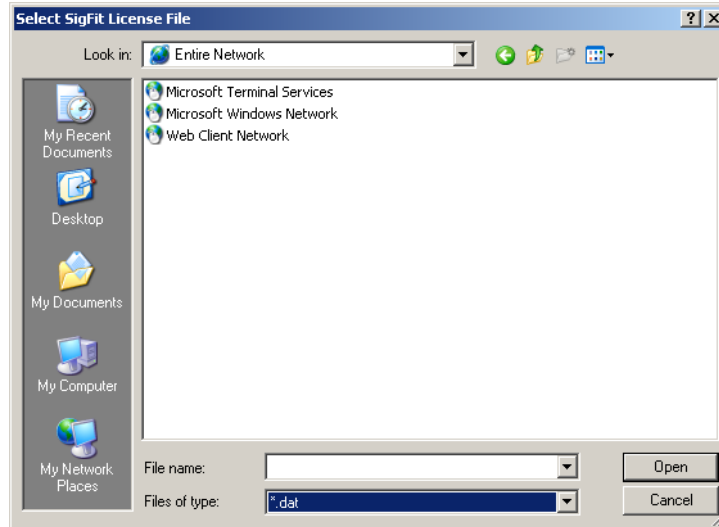## 1.4   Installation of Sigmadyne FLEXnet Licensing

If you are upgrading from a prior version of the license server software please be sure to either stop the existing license server by using the lmtools utility or uninstall the license server software. If you uninstall the current license server please be sure to copy the license file from the license server install location. Please note that previous versions of the license software install to C:\Program Files (x86)\Sigmadyne\SigmadyneFNLicensing while the current version installs to C:\Program Files\Sigmadyne\SigmadyneFNLicensing.

Sigmadyne FLEXnet licensing is installed on the license server only by double-clicking SigmadyneFNPLicensingv11.17.0.0_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 using Sigmadyne FLEXnet licensing.

Follow the instructions of the installation dialogs. You will be given a choice to install a license file.
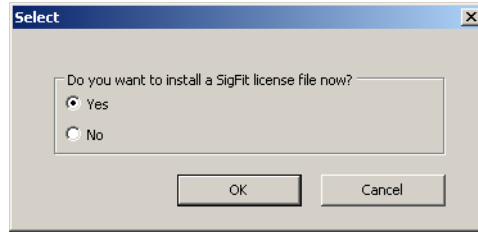
If you answer yes, then you will be prompted to pick a license file which will be installed and used to start the FLEXnet service named Sigmadyne License Manager.

This will complete installation of the FLEXnet licensing software. To further configure the FLEXnet license manager use the lmtools utility found in Start/SigmadyneFNPLicensingv11.17.0.0.

### 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 10. 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.
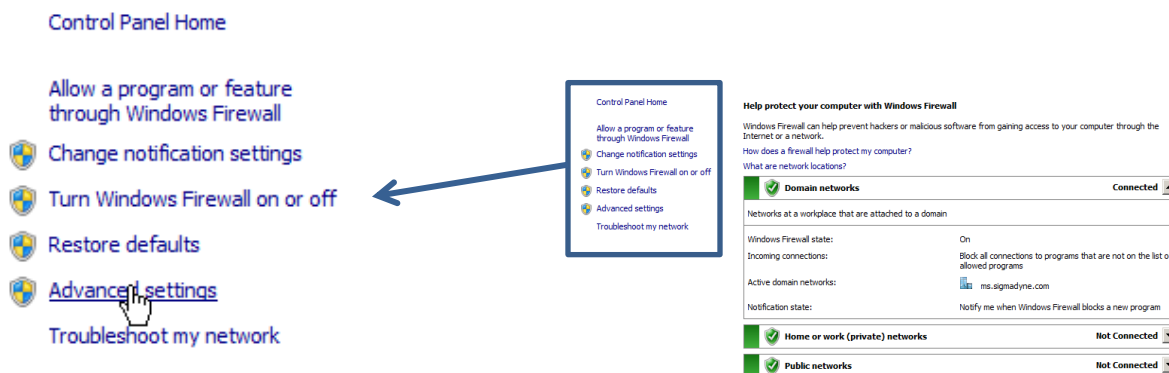
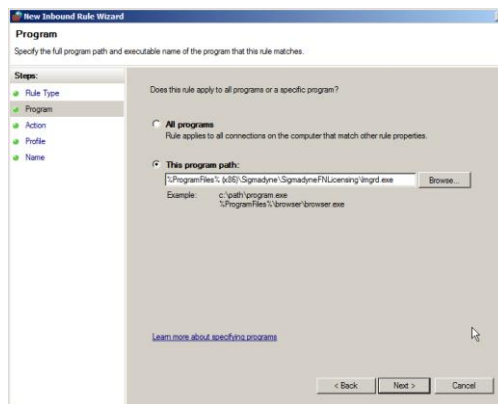Pick Inbound Rules and then under Actions pick New Rule…

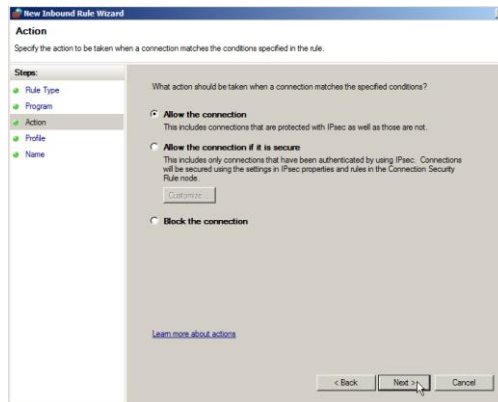Select Program for the Rule Type as shown below. Pick Next.
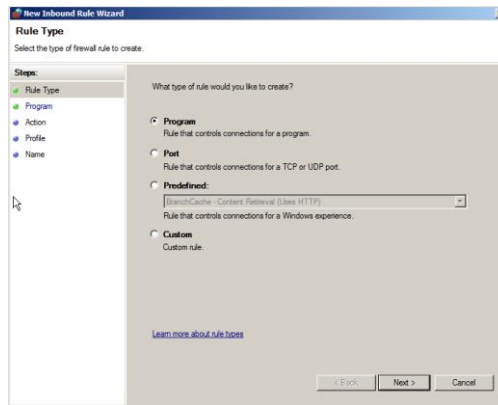
For the program path browse to the location of lmgrd.exe located in the platform dependent location specified in the table below.

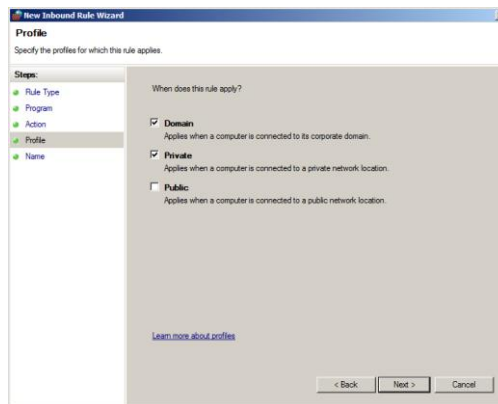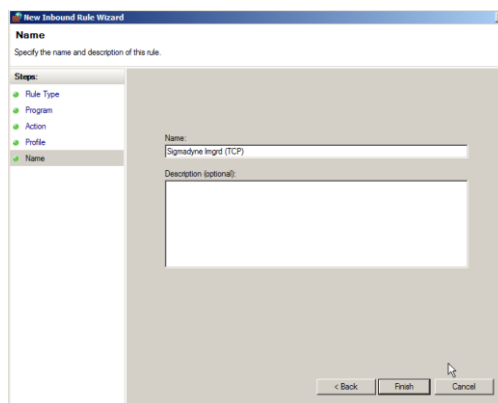| Platform	Path to lmgrd.exe and SIGMADYN.exe
64 Bit Windows	C:\Program Files\Sigmadyne\SigmadyneFNLicensing

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 lmgrd (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.
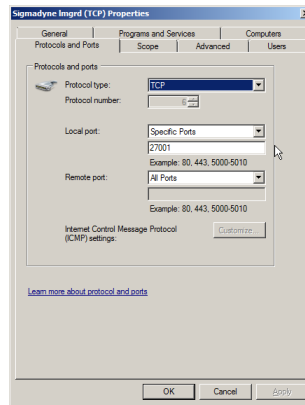
A second inbound rule should be added in a similar fashion to allow SIGMADYN.exe to pass TCP traffic on any port number or a port number specified in the license file. The port number for SIGMADYN.exe may be specified by adding PORT=*port_number* to the end of the VENDOR line in the license file. If this port specification is not made in the license file, then it is important that any port be allowed for SIGMADYN.exe as the port number may change if the license manager service is restarted.
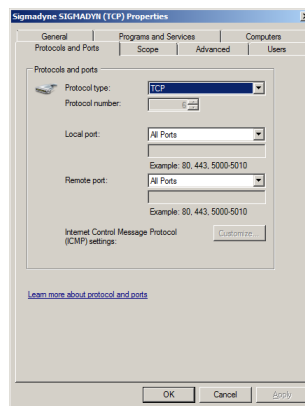
1.5   Testing Your Installation of SigFit

Testing your installation requires opening an existing file supplied with the examples and running an analysis. Please follow the following steps:

1. Double click the file at C:\Program Files\Sigmadyne\SigFit*{version}*\Test\test.sig.
2. Pick File, Run…, and Submit.
3. The job should run with no errors as shown below.
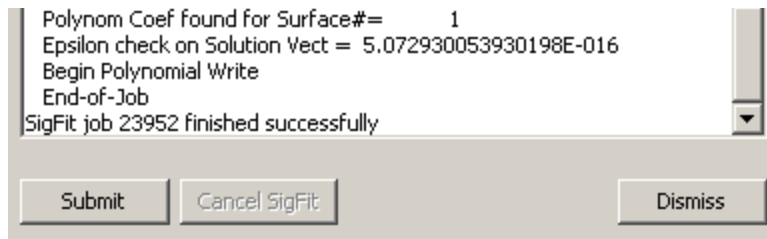
If a FLEXnet License Finder dialog appears, pick Cancel and see Section 1.7 below paying particular attention to 1.7.1 point 1, failure to properly specify a license location during install.

1.6   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.

1.7   Troubleshooting the FLEXnet Licensing System

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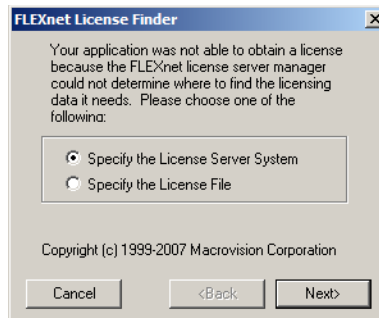
Do not attempt to specify the license through this dialog. If you get this dialog it means the license is inaccessible and the reason for this needs to be determined before attempting to run SigFit. Hit Cancel and follow the instructions below.

1.7.1   Quick Things to Check

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

1.   The most common cause of failure to obtain a license is the failure to properly specify the location of the license server when SigFit is installed as shown earlier in the installation procedure. See Section 1.7.5 for instruction on checking this. Please at least perform this step before contacting Sigmadyne support for help with licensing issues.
2.   Installation of License Sever 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.
3.   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.
4.   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.

1.7.2   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 the path location shown in the table below.

Architecture of License Server Machine	Debug Log File Location
64 bit	C:\Program Files\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. You may want to wait for Sigmadyne to advise what steps to take next or you may continue with troubleshooting as described below.
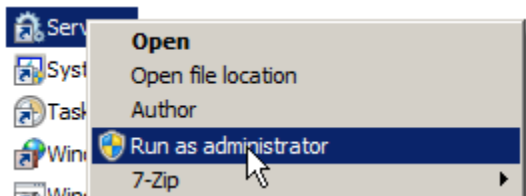
1.7.3   Determining if the License Service is Running

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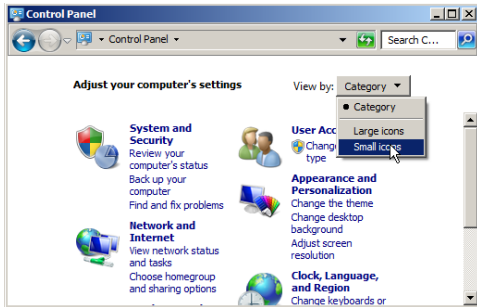
2.   Pick the Administrative Tools icon and then right-click Services and pick Run as Administrator to view the services running on the machine with administrator privileges.


3.   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.
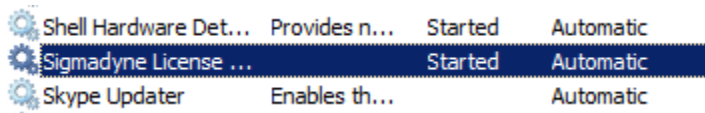
4.   If the status is blank then select the service in the list and pick Action/Start.
5.   If the service does not start then try restarting the license server machine.
6.   Report to Sigmadyne the results of these steps.

1.7.4   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 SigmadyneFNLicensingv11.17.0.0 program group under the Start menu as shown below. Be sure to right-click on the icon and select Run as administrator.
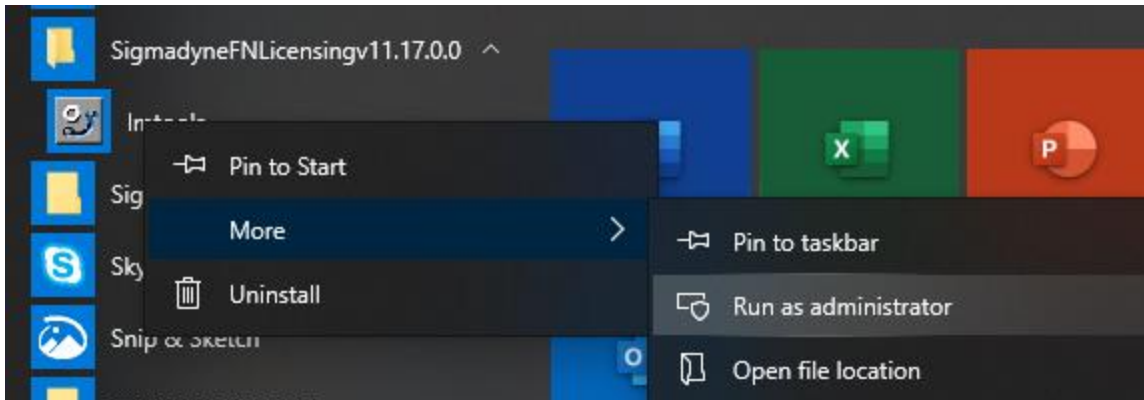
1. On the Service/License File tab be sure that Sigmadyne License Manager is selected and that "LMTOOLS ignores license file path environment variables" is checked.
2. On the Server Status tab pick Perform Status Enquiry. If the license is accessible then the output should look something like the below. 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 Sun 5/3/2020 14:26

[Detecting lmgrd processes...]
License server status: 27001@POP2
    License file(s) on POP2: C:\Program Files\Sigmadyne\SigmadyneFNLicensing\license.dat:

      POP2: license server UP (MASTER) v11.17.0

Vendor daemon status (on POP2):

  SIGMADYN: UP v11.17.0
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_DESOPTEQN:  (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@POP2
    License file(s) on POP2: C:\Program Files\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@POP2;
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.

1.7.5   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.
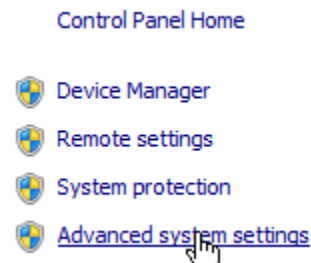
System Environment Variable	Value	Notes
SIGFIT_LICENSE_TYPE	FLEXNET	This value is used verbatim.
SIGMADYN_LICENSE_FILE	*port_number@servername*	*port_number* is the TCP/IP port number specified in the license file for communication. The default is 27001. You may optionally change the port number in the license file but it must be consistent with this setting on the client machine(s). *servername* 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.
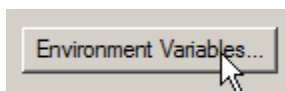
1.   Right-click the Computer icon on your desktop or in the Start menu and pick Properties.
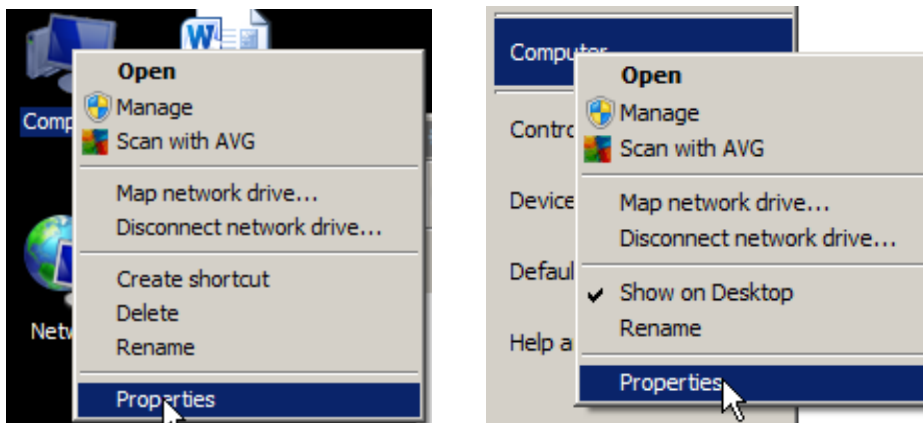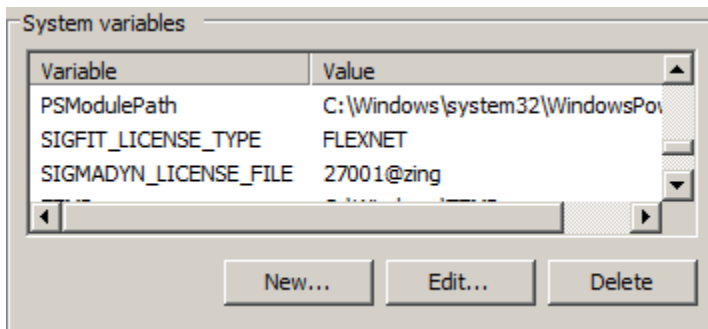

2.   On the left-hand side pick "Advanced system settings."

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.