

Easy5 2022.3

Installation Guide

For Windows®



Main Index

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September 5, 2022

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Welcome

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Introduction

These notes describe how to install Easy5 2022.3 on a computer running the Windows 10 operating systems. **You should review these notes before installing Easy5**. Keep these instructions with the *Easy5 User Guide* for future reference.

Please refer to the Easy5 *Release Guide* for additional information about using Easy5 on Windows operating systems.

Notes:	
	■ For the latest information on supported platforms for upcoming releases of MSC products, please visit the following web site: http://www.mscsoftware.com/Support/Platform-Support/Default.aspx ■ The MSC Licensing software is now delivered via its own Product Page on the SDC. Installers for the MSC Licensing software are provided on a number of hardware platforms. Delivering the MSC Licensing software separately from the individual MSC products allows us to provide you with updates to the licensing software more effectively. If there are any questions, please contact MSC Technical Support for assistance. ■ Some sections of the Installation Notes and Release Guide are duplicated for ease-of-use.

Conventions Used in This Guide

This guide uses the following text conventions to identify functions and procedures:

- Text in a Courier font indicates a file name or text to be entered.

  Enter `open_loop` in the input field.

- Text enclosed in angle brackets indicates that you are to press a key.

  Press <Enter>.

- Most keyboard shortcuts require that you press the Control key together with another key.

  Press Ctrl + S.

- Text in a bold Arial font with right angle brackets between words indicates that you select a menu and subsequent submenus with your mouse.

  Go to **File > Print Preview** to view your document.

- Text in an bold font indicates that you are to select a button to perform an action.

  Click **OK** to close the window.

- *Indented items in italic text are notes used to highlight certain informational points.*

1 System Requirements

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Minimum System Requirements

Minimum system requirements for installation and use of Easy5:

- Intel (or compatible) processor-based computer running Windows 10.
- Intel 64-bit architecture (EM64T)
- 256 MB of RAM.
- 700 MB of free space for a complete program installation.
- CD-ROM drive if installing from a CD-ROM.
- Mouse or pointing device.
- Video display card and monitor combination providing at least 1,024 by 768 pixels of graphic resolution at 60 Hz with 256 colors.
- An Easy5-compatible Fortran compiler (Intel Visual Fortran 17.x, or GNU gfortran 7.3.0) is required. GNU gfortran 7.3.0 is installed as part of the Easy5 installation. However, certain features require one of the other Visual Fortran compilers. See "Required Software" for more information.

The following additional requirements may apply based on certain conditions:

- If you have a concurrent license, you need to have installed network TCP/IP software before running Easy5. This software provides communication between the MSC License Server and Easy5. See "TCP/IP Network Software" for more information.

Note:	There is a limitation in Windows 10 that may affect the layout of Easy5 items in the Start menu. If you have more than one Easy5 version on your Windows 10 computer, the Easy5 Start Menu features for the second and subsequent installations may be limited or incomplete. In that case you will need to access Easy5 features from the desktop icon if they are missing from the Windows Start menu. All features are still available, but they may not be available from the Windows Start button.

Hardware and Software

Hardware Recommendations

For reasonable Easy5 performance, the following hardware is recommended:

- At least 1 GB of physical RAM.
- A video display card and 17-in monitor combination providing 1,280 by 1,024 pixels of graphics resolution at 75 Hz or greater with 256 colors. We suggest a dual-view monitor configuration, actually.
- At least 300 MB of additional free disk space for storing user files on your hard disk.

Required Software

The following sections describe the software required to install and run Easy5.

Fortran Compiler

Easy5 requires the use of a Fortran compiler to enable compiling and linking of your model executable file. In addition, the compiler provides an object library manager and debug environment.

Easy5 currently supports the following Fortran compilers:

- Intel Visual Fortran 17.0 Update 5 (package 267) or newer.
- GNU gfortran Version 7.3.0 (Mingw) *

*included with your Easy5 installation.

GNU gfortran is included in the Easy5 installation. However, certain features are not available with gfortran. These features include export of Easy5 models as MAT emx files or Adams XFE files.

During the installation, you are prompted to specify the appropriate Fortran compiler. If no other Fortran compiler has been installed, GNU gfortran will be the default choice. If the specified Fortran compiler has been installed, Easy5 Setup configures Easy5 to use the specified compiler.

The Intel Fortran compiler can be installed after Easy5 is installed; it is recommended, however, that it be installed *before* installing Easy5 so Easy5 Setup can correctly configure Easy5. Otherwise, simply perform a Maintenance update via the Control Panel/Add/Remove Programs. See "After Installing Easy5" for more information.

Caution:	If Microsoft Visual Studio is installed, it must be VS 2015, version 14.0.25420.01 or newer. The Linker must be from VS 2015 or newer.

C Compiler

For certain operations, Easy5 also requires the use of a C compiler to enable exporting an object or creating an executable. These operations are summarized in the following table:

Intel & AMD x86-64 Windows						
		Interfaces with Other Tools				
	Standalone Models	with Adams			Matlab/ Simulink	FMI
		Function Evaluation**	Co-Sim*	ESL Import**	Co-Sim#	All functionality
Compatible C/C++ Compiler	Required for C User Code Components$	Required if there are C User Code components in Easy5 model	Visual C required if there are C User Code components in Easy5 model	Required if there are C User Code components in Easy5 model	Visual C++ required	Required if there are C User Code components in Easy5 model

*Adams requires Intel® Fortran
**Intel® Fortran & Visual C++ recommended

#MATLAB/Simulink® requires Intel Fortran

Easy5 currently supports the following C compilers:

- Visual Studio 2015, version 14.0.25420.019 or newer, with Intel Fortran.
- GNU gcc/g++ Version 7.3.0 (Mingw)*

*included on the same media with your Easy5 installation

Note:	The Visual Studio Shell that ships with older versions of Intel Fortran may not contain a C compiler, hence it is unable to perform the operations in this section. Intel recommends a compatible Visual Studio Community or Professional edition, with C++ component installed.

TCP/IP Network Software

If you will be using a "concurrent/campus" license, your computer must also have network TCP/IP software installed, which is used for communication between the MSC License Server and Easy5. A "node-locked" license does not have this requirement.

FLEXlm License Server

Easy5 2022.3 utilizes an MSC License Server for any "concurrent/campus" license. The MSC.Licensing software must be installed separately from Easy5 (and can be done so from the first menu option during installation).

Note:	Easy5 2022.3 requires MSC License Server (FLEXlm) v11.13 or greater (installed separately). Easy5 2017 required MSC License Server 11.9, so you may need to update your MSC License Server installation before installing Easy5 2022.3.

Adams Controls Compatibility

Adams Controls, the companion product that allows Easy5 models to be used in conjunction with Adams, is fully compatible with the 64-bit version of Easy5 using Intel compilers only. Please consult the current version of Adams documentation per the Adams support site (**SimCompanion → Product Info and Docs → Adams → Supported Versions of Integrated Products**) to confirm compatibility with Easy5.

Other Software

If you plan to utilize the Easy5 User Code Component in C language, which gives you the capability of coding user-defined components directly in C, then you will also need an Easy5 compatible C compiler installed on your computer, as described above. In particular, the Intel Visual Fortran compilers require

specific Microsoft C++ compiler environments to function correctly -- please consult your Intel Visual Fortran compilation documentation for more details.

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Overview

You can install Easy5 software in a variety of configurations that depend on any of the following:

- What kind of license you request.
- Where and how Easy5 license management software is installed.
- Where and how Easy5 program files and settings is installed.
- How your local computer network is configured.
- Whether Easy5 has been previously installed.

The following sections provide an overview of considerations for installing Easy5.

Universal Naming Convention Paths and File Sharing

The Windows operating systems provide two ways of accessing files from the network. The first is called *drive-mapping*, a method used to map a drive letter to a network path. The second method is called *universal naming convention* (UNC) paths, which uses a unique "shared" path description of the form:

\\computername\sharename\path

This format identifies a previously "shared" file path to a given network computer. Drive mappings are less reliable because they only apply to a particular computer and must be reestablished each time you start your Windows session, which can be time-consuming.

For these reasons, it is recommended that you use UNC network share paths instead of drive mapping when referring to license files on other computers by their path. This is required if you need to "point at" an existing license installed on a different computer during an installation of Easy5 on another computer.

For UNC paths to be visible, the top-level folder must be share-enabled. Allowing a folder to be shared makes it visible to the network. Note that you cannot use UNC paths even from a local computer pointing to itself without enabling sharing of the folder. See your Windows help for further information on file sharing.

Minimum User Privileges

The Windows operating systems provides a multi-user environment with a high level of security, so only specific users of your computer can perform certain operations. Three so-called "Groups" are relevant for Easy5 purposes: Administrators, Power Users, and Users. Administrators have complete and unrestricted access to the computer, while Power Users possess most administrative powers with some restrictions.

Note:	The default installation location for Easy5 2022.3 is C:\Program Files\MSC.Software, which is a change from previous versions. If you accept the default location, then modification of the installation after installation will require Administrator privileges.

Users can operate the computer and save files, but cannot install programs requiring registry changes (such as Easy5) or make system changes (required for performing an Easy5 Per-User Setup).

Easy5 Setup requires the following minimum group membership for individual users:

Installer of Easy5 with a *node-locked* license	Non-Restricted
User of Easy5 (for executing a Per-User Setup)	Non-Restricted*

*Non-Restricted = ability to modify/set registry keys in the HKLM/Software registry hive.

For installation of an Easy5 **concurrent** license, specific license management files may need to be installed to a Windows system directory. Therefore, Easy5 Setup cannot continue with a concurrent license installation if you do not have Administrator group privileges. See Chapter 7: Introduction to FLEXlm for information about licensing.

For other Easy5 installers or users, **Non-Restricted** access is required to enable the Easy5 Setup to make required program-specific registry settings changes. Individual users of Easy5 should each perform a *Per-User Setup* to properly configure Easy5 for their use. This requires a minimum of Power Users group privileges, and should be performed as the actual user (not the Administrator).

See "Per-User Setup" for more details. Please contact your local system administrator to help you properly configure Easy5 installer and user group access (privileges).

Options for Installing Easy5 Files on Your Computer

The following sections explain the requirements and options that you should keep in mind when deciding how to install Easy5. The operation of the licensing system is described in more detail in Chapter 7: Introduction to FLEXlm.

Node-locked license:

- An Easy5 node-locked license file is provided, for operation of Easy5 on a computer with a specific MAC (ethernet) address specified in the license file.
- There is no limit to the number of simultaneous Easy5 executions.
- You can only use Easy5 on the computer with the appropriate MAC address as specified in the license file.
- You can launch Easy5 from a laptop computer without any network connection.

Concurrent license:

- Installation of MSC Licensing software is required before a concurrent license can be used (contact MSC Software support).
- Installation of program files and specification of the previously installed license file or "*port@host*" designation is required.

- Easy5 runs only up to the maximum number of Easy5 users (or tokens) provided by your concurrent license.
- Easy5 (the application or the licenses) can be distributed across a network.
- The computer acting as the License Server is connected to the appropriate serial number (MAC ethernet address for Windows, hostid for Linux).

You can install a MSC License Server along with other FLEXlm-managed applications and license servers. If the license file uses a License Server running on a Linux-based system, then no Windows based serial numbers (hardware key, or MAC address) are required.

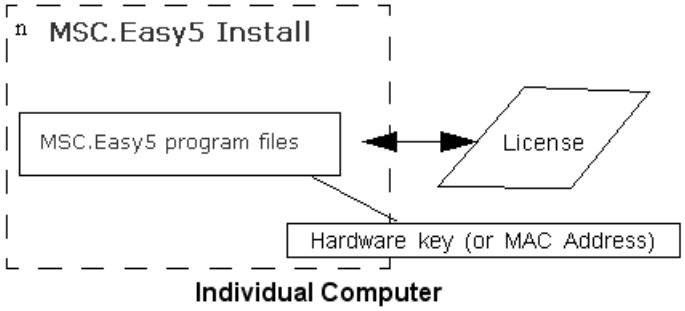
Note:	You can only use Easy5 from a laptop computer when connected to the License Server (and, of course, when using a concurrent license hosted by the License Server).

Typical Installation Scenarios

The following scenarios are depicted in schematics, suggesting several typical configurations used for installing Easy5. Note that where appropriate in the schematics, numbered steps denote the recommended order of installation steps. These represent typical configurations, but not all possible installation configurations.

A: Node-Locked Installation

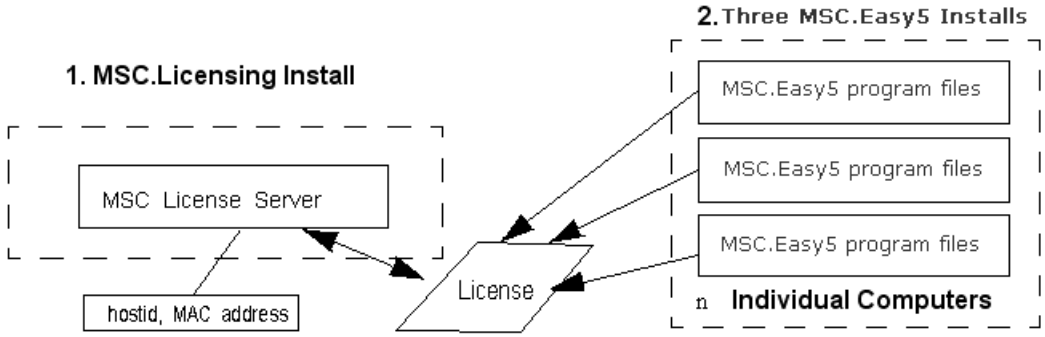
This scenario is used exclusively for node-locked licenses. This is the simplest form of license management and the best suited for portables.



A. Node-Locked Installation

B: Centralized License Manager

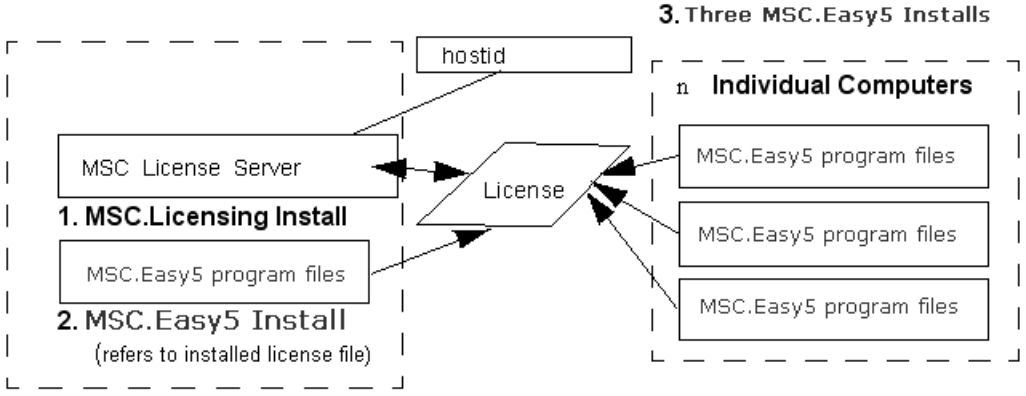
This scenario is used to centralize license management from a given computer, workstation, or server, but still install Easy5 program files on individual computers for top performance. MSC Licensing software is installed separately and prior to Easy5 software.



B. Centralized License Manager Installation (Concurrent License Required)

C: Centralized License Manager With Program Files

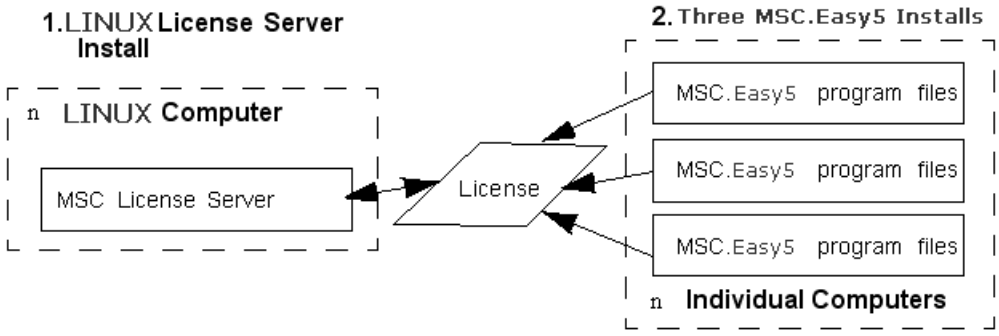
This scenario is very similar to scenario B except that the program files are also installed and available for use from the computer hosting the License Server. Note that the License Server, which requires the installed concurrent license file specification, should be installed *before* the Easy5 program files.



C. Centralized License Manager With Program Files (Concurrent License Required)

D: Existing Linux-Based License Server

If you are hosting Easy5 on both Linux and Windows operating systems, you can simplify your license management by using the existing Linux-based License Server for your Windows computer. No instructions are provided here for installing the Linux-based License Server; it is assumed that this has already been done. The only requirement is that you can establish a TCP/IP-based network connection between your computer and the Linux-based License Server.



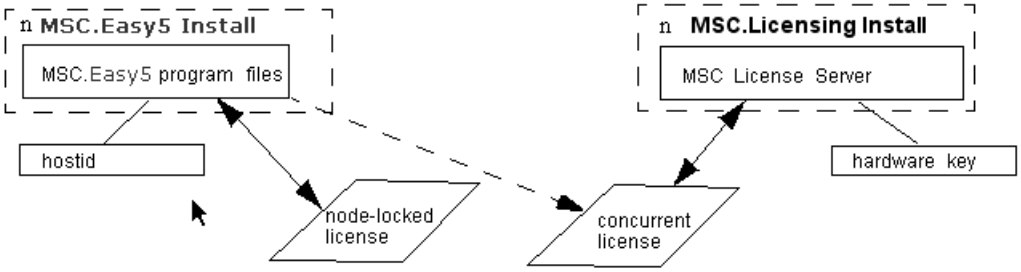
D. Existing LINUX-Based License Manager (Concurrent License Required)

E: Alternating Between a Node-Locked and a Concurrent License

This scenario can be used to provide license management to a variety of networked PCs, where one or more computers (for example, laptops) may be disconnected from the network from time to time. It requires at least two licenses: a concurrent license (on the network), and a node-locked license.

Use of a hardware key for the node-locked license allows for additional flexibility as to which computer can be disconnected. See also Scenario **F** for information on running two concurrent licenses. The node-locked license provides all that is needed for the computer that is using it, and is often the simplest way of providing license management especially if the *portable* computer varies.

The hardware key can be physically shared among several PCs by alternating which computer is connected to the hardware key and by setting the environment variable `MSC_LICENSE_FILE` as needed before launching Easy5 from an *Easy5* Command Shell.



E. Switching Between a Node-Locked or Concurrent License

Note:	Use either environment variable `MSC_LICENSE_FILE` or ALT_EASY5_LICENSE (and `USE_ALT_EASY5_LICENSE`).

F: Alternating Between Two Concurrent Licenses

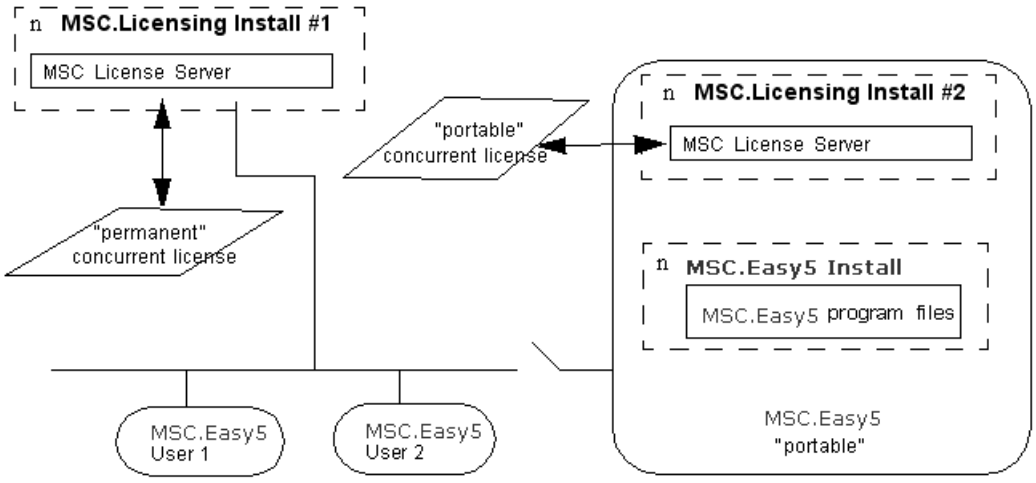
This scenario provides license management to a variety of networked computers, where one computer (for example, a laptop) may be disconnected from the network from time to time. It requires at least two concurrent licenses, each with a minimum of 1 seat per license feature: a permanent concurrent license, and a portable concurrent license. Both licenses can be tied to either a MAC Address (ethernet serial number) or a hardware key; the latter providing greater flexibility because it ties the license server, not to a particular PC, but rather a particular key, which can be more easily moved.

Thus, two *separate* License Server installs are made on two different computers, each with their own concurrent license file. When the *portable* computer is connected to the network, any user on the network can access its license as needed or available.

This requires you to set the environment variable `MSC_LICENSE_FILE` to the concatenated path of the two licenses files enabling either license server to provide a license when needed. When the first license is unavailable, the second license will be automatically checked. Therefore, when the *portable* computer is disconnected from the network, its license server becomes unavailable to the network, but is still available for use to the *portable* computer.

For example, assume that machine Net1 is the *permanent* license server, and machine LapTop is the portable license server. Each server has a concurrent license, and is given the two UNC paths: `\\Net1\EzLicMgr\lmgr\msc.lic`, and `\\LapTop\EzLicMgr\msc.lic`, respectively. Each user then assigns the environment variable `MSC_LICENSE_FILE` to the following value:

```
\\Net1\EzLicMgr\lmgr\msc.lic;\\LapTop\EzLicgr\msc.lic
```



F. Using Two Concurrent Licenses

An alternate method would be to use the *port@host* specification method for both computers. If the *permanent* license server is accessed using `1700@Net1` and the laptop by `1700@Laptop`, then assign the environment variable `MSC_LICENSE_FILE` to the value `1700@Net1;1700@Laptop`.

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Pre-Installation Procedure

The following steps are recommended before installing the Easy5 software:

1. **Decide which Easy5 installation type best suits your requirements and constraints**. See "Things to Consider" for more information.

   To install most Easy5 license management software, you need Administrator group privileges.

2. **Ensure that your current system date is correct. To check your system time, go to Start > Settings > Control Panel** and double-click the Date/Time icon. Changing the system date *after* installing Easy5 can cause *any* Easy5 license to become invalidated.

3. If applicable, install Intel Visual Fortran compiler software on your computer (otherwise GNU gfortran will be used). A typical installation is recommended for all supported compilers. If prompted whether you want the Fortran environment setup for use in your standard environment, it is recommended that you select **No**.

   If you do not have a Fortran compiler to install, Easy5 includes a free GNU compiler suite (Fortran and C). If you want to continue installing Easy5 (without a Fortran compiler), and install the Fortran compiler later please see "After Installing Easy5" for more information.

4. **If necessary, install network TCP/IP software to enable a "concurrent" type license**. To see if the software is already installed: go to **Start -> Control Panel -> System and Security -> Administrative Tools -> Computer Management -> Services and Applications -> Services** and look for "**TCP/IP**". If the software is not installed, see your local system administrator for assistance.

5. **Have the following three items ready from your Easy5 installation package:**
   - Easy5 installation downloaded executable file or CD.
   - Easy5 license file specification (as a file path, or preferably, as a *port@host* string).

6. **Uninstall existing versions of Easy5 (optional)**. Every release of Easy5 is installed in its own registry and default destination folder, so older releases can be retained, if desired.

Silent Install

A so-called "silent install" can be setup for Easy5 2022.3, by:

Step 1: Running a standard installation (using the GUI) and specifying the recording of a "response file".

Step 2: Running a silent install and specifying a "response file" to read from.

This is done as follows:

1. Run the Easy5 install per the command-line invocation (from a shell prompt):

   path`\setup.exe -r [-f1 "`*response_file_path*`"]`

2. Run the Easy5 silent install per command-line invocation (from a shell prompt):

   path`\setup.exe -s [-f1 "`*response_file_path*`"]`

   Where:

   The default *response_file_path* = `%WINDIR%\setup.iss`

The square brackets ("[ ]") are only used to denote an optional argument.

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Install Procedure

Note:	The InstallShield installer will recommend that all programs be closed before running the Easy5 2022.3 installer. We recommend that you first reboot your computer, then install Easy5 2022.3 before starting any other programs.

To install Easy5 on your computer running Windows, please perform the following steps:

1. Insert the Easy5 installation CD into your CD-ROM drive, or if you are not using an installation CD, select the installation executable downloaded or delivered from MSC.
2. Start the Easy5 Setup program.
   - If you are installing from CD and the autorun feature in Windows is enabled, the initial window will appear automatically.
3. After selecting **Next**, you are presented with a Customer Information dialog. Note that if you have adequate privileges, you will be prompted whether or not to install the software for *all users*. This means that Easy5 shortcuts are enabled for all users of your computer. This is the recommended installation scope, as it allows other users to run Easy5 from your computer, when available. If offered, we recommend you select this option.
4. **Easy5 Setup prompts you for Setup type and destination.**
   By default, all available components are installed with the **Full** default option. However, you can elect what components to install by selecting the **User Selectable** option. A third option, **Client** installation is used to setup local shortcuts to utilize an installation of Easy5 on another computer. See the section "License File" for more information on a Client install. For all Setup Options, you may override the default destination path with the **Browse** button.
5. After you select **Next**, Easy5 Setup prompts you with a confirmation dialog before beginning the installation of files. Select the **Next** button to install the software.

   A progress bar will appear in the lower right-hand corner, indicating installation progress. Depending on the number of components selected, and the hardware being used, installation of the all files (about 200 MB) should take no more than 15 minutes of time (but typically, less than a few minutes).
6. **Easy5 Setup prompts you to select a Fortran compiler**.

   If you have already installed a Fortran compiler, it is automatically selected as the default.

   Easy5 requires the use of a Fortran compiler to build executable versions of your model. By selecting a compiler, Easy5 Setup configures Easy5 for use with the selected compiler. In addition, Easy5 Setup will setup Easy5 for all Fortran compilers found installed, so that you can change compilers easily later. To change the Fortran compiler used after installation of Easy5, see "Updating Your Fortran Compiler" for more information.

Note:	If you will be ***only*** using an Analysis Only license, then you can select **No Compiler**. This will remove requirements for a Fortran compiler, but also disable any ability to rebuild Easy5 model executables.

7. **Easy5 Setup prompts you for an Easy5 *working folder*.**

   The *working folder* is the default folder where Easy5 is launched from. Please refer to your Release Guide for more information about working folders.

   If you are installing a *common group* installation, other users of Easy5 on this computer will need to perform a Per-User Setup.

8. **Easy5 Setup prompts you for the license path specification.**

   Specify the license file path depending on the type of license you are issued and whether you want to install Easy5 license management programs on your computer:

- If you have a node-locked license, specify the full path of the license file in the Easy5 License File Path field and click **Next**.
- To utilize an existing **MSC License Server** (installed previously on your or another networked computer or server) for license management with a concurrent/campus type license, either:

   a. Specify the full path of the installed MSC license file

   b. Specify the path of a local copy of the installed MSC license file

   c. Specify the *port@host* TCP address for the previously installed license file, and click **Next**. This is the preferred method for a concurrent license.

   d. If the license file is on a network, use its UNC path (see "Universal Naming Convention Paths and File Sharing" for more information). Note that the Browse button only displays the directory structure, not individual files.

9. **Easy5 Setup displays a final confirmation window.**

   When you click [Finish], you have successfully installed Easy5. You may need to restart your computer to install license management drivers and related license services and to update any executable programs that may already be running. To view the README file, select the appropriate check box. This file contains information about the current release.

5 After Installing Easy5

- Per-User Setup 26

Per-User Setup

After installing Easy5 program files on this computer, other users of Easy5 (if installed as a common group) still need to be configured for use with Easy5.

This step is already completed for the installer by Easy5 Setup. Thus, the following action is required at least once for **all other current and future Easy5 users** of this computer:

- After each (additional) user logs in to the computer (for the first time after Easy5 has been installed), they should perform a "**Per-User Setup**" from the **Start Menu > Programs > Easy5 2022.3 > Per-User** shortcut.

  Running this shortcut, which invokes a local instance of Easy5 Setup, requires a minimum of Power Users group privileges for each user.

Easy5 Setup then performs the following tasks:

- Allows the user to specify (and create) a personal working folder (although a common one can be specified)
- Properly configures Easy5 (certain required registry settings can *only* be made when each user is actually logged in).

Important:	Please note that without such a "Per-User Setup," Easy5 will NOT be properly configured for use for users other than the installer. Also, a minimum of "Non-Restricted" privileges are required to execute this step. Finally, if offered the choice, this installation should always be performed as the actual user, not the Administrator.

6 Updating Your Fortran Compiler

- Fortran Compiler Installation Options 28

Fortran Compiler Installation Options

If you wish to use the Intel Fortran compiler with Easy5, it is best to install it on your computer ***before*** you install Easy5. Otherwise, Easy5 will be configured to use the MinGW compiler that is always provided by the Easy5 installer.

After Easy5 installation, some additional scenarios are also possible:

- Installing or updating an Easy5-compatible Fortran compiler locally after Easy5 has been locally installed.
- Installing a different Easy5-compatible Fortran compiler after Easy5 has been locally installed.
- Using an Easy5-compatible Fortran compiler installed on another computer after Easy5 has been locally installed.
- Switching from one compiler to another (if you have multiple compilers installed).

During your Easy5 program installation, a batch file called EZ5VARS.BAT is created and stored in your top-level Easy5 program directory, given by the environment variable EZHOME. After Easy5 Setup has determined which compiler is to be used, it automatically updates the file `EZ5VARS.BAT` with this information by setting certain local environment variables. If it cannot find the appropriate version of Intel Fortran locally, Easy5 Setup completes the installation with the MinGW Fortran compiler configuration.

Certain environment variables used for compilation and linking steps. These environment variables are:

■ PATH:	*Path(s) where the compile, library-manager, and linker commands are located (required).*
■ LIB:	*Path(s) where Fortran and C run-time libraries are located (required).*
■ INCLUDE:	*Path(s) where Fortran and C include files are located (optional).*

While these variables can be set as global variables (see the section on environment variables in your Release Guide), Easy5 is installed to set these values in your local Easy5 environment using the batch file `%EZHOME%\EZ5VARS.BAT`. Thus, to update these values, you either need to reinstall Easy5 (Program Files) or manually edit this file. Specifically, for the cases previously outlined, you can take the following steps:

1. **Switching from one installed Fortran compiler to another**.

   Prior to launching Easy5 set environment variable EZ5_2022_FORT_COMP to the appropriate value: (see Table below). Please note that this will only work if the setting you choose has a corresponding Fortran compiler installed.

EZ5_2021_1_FORT_COMP	Fortran Compiler
GNU	GNU gfortran 7.3.0
IFORT	Intel Visual Fortran (w/ MSVC10) on 32-bit processor
EM64T_IFORT	Intel Visual Fortran (w/ MSVC10 on EM64T 64-bit processor)

2. **Installing an Easy5-compatible Fortran compiler after Easy5 has been installed.**

   You need to update Easy5's initialization scripts so that it recognizes where the compiler is installed. This is done using a Maintenance (Modify) Update.

   After installing the compiler software, go to **Control Panel Add/Remove Programs**, select the Easy5 2022.3 installation, and select **Change/Remove**.

   An Install Shield dialog appears that offers you the choice of Modify, Repair or Remove.

   Select **Modify** and you will be prompted to select components for installation or removal (if you don't want to change components that get installed, don't select anything).

   When prompted, select the appropriate Fortran compiler, and the **Next** button. Easy5 Setup will reconfigure your environment to use the specified Fortran compiler.

3. **Installing a different Easy5-compatible Fortran compiler after Easy5 has been installed.**

   Reinstall Easy5 using Maintenance (Modify) mode as described in Option 2.

4. **Using an Easy5-compatible Fortran compiler installed on another computer.**

   While the Fortran compiler software is usually installed on your local computer, it can also be accessed across a local area network.

   Although installing the Fortran software locally ensures better performance and is the standard for most personal computers today, it is possible (although ***not*** recommended) to use a Fortran compiler installed on a network server for use with Easy5.

   In this case, you must edit file `EZ5VARS.BAT` and provide appropriate paths for `PATH, LIB`, and `INCLUDE` variables.

Caution:	If you use a Fortran compiler installed on another computer, you are responsible for adhering to software licensing agreements for your Fortran compiler.

7 The Flexible License Manager

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Overview

Easy5 uses the Flexible License Manager (FLEXlm) from Flexera Corp. Regardless of whether you have a *concurrent* or *campus* type license, you will need to have a FLEXlm (MSC) License Server running. A *license server* is comprised of a *vendor daemon* program and a *license daemon* program, as described below.

All software required to run FLEXlm with existing license daemons is supplied with Easy5, including the FLEXlm license file template (`license.dat`). The daemon programs run in the background to manage the Easy5 licenses. This section gives you, as the system administrator, a general overview of FLEXlm and how Easy5 licenses are managed, and explains the basics of floating (network) licensing and gives a quick overview of the FLEXlm components. It explains where system administrators have control and where end users have control.

Introduction to FLEXlm

FLEXlm is a network license manager used by many software developers to control the use of their software products. FLEXlm allows software licenses to be available (float) anywhere on a network, instead of being tied to specific machines. Floating licensing benefits both users and system administrators. Users can make more efficient use of fewer licenses by sharing them on the network. You can control who uses the licensed application and the node or nodes where the licenses are available.

Types of Licenses

A *concurrent* license limits the maximum number of simultaneous users of a given set of license features within a given site. A *campus (*or *Masterkey)* license is essentially the same, but allows access to all possible license features, which are limited only by a maximum token count that can be used at any one time. Both of these licenses are referred to as *floating*. Please contact your MSC Software sales representative for more details on campus licensing.

Typically, an MSC License Server (a separate program from Easy5) is installed on a network server to administer the floating licenses within a local area network. The Easy5 program files are then either loaded on individual computers or only on the network server.

A *node-locked* license is used to run Easy5 on a given computer. The number of Easy5 applications running at any given moment is limited by the number coded into the license file. The advantage of this type of license is that no license server program is needed; the licenses are tied to the hardware address of the computer.

Both types of licenses use the license management software, which is designed to prevent tampering with the system date. If the system date is modified after Easy5 has been installed, the Easy5 license will be invalidated. Furthermore, a new license will not fix this problem. See the troubleshooting section in the Release Guide for further information.

Caution:	Please do NOT reset the system date after installing Easy5. This can invalidate any Easy5 license. Re-validation can be a difficult and cumbersome process.

FLEXlm Components

The four main components of FLEXlm are:

- License File (the Easy5 license file is called `license.dat`).
- Application Program (Easy5).
- License Server (MSC).
- Vendor Daemon (MSC).

License File

Licensing data is stored in a text file called the license file, which for Easy5 license file is typically named `license.dat`. The license file is created by the MSC Software licensing staff and sent via email to the system administrator. It contains information about the server nodes and vendor daemons, and one line of data (called a `FEATURE` line) for each licensed feature. A feature line contains an encryption code based on the data in that line, the *`hostids`* ("host-id", or a unique identifier for a computer) specified in the server lines, and other vendor-specific data.

You can override the location where the license file is stored by setting the environment variable `MSC_LICENSE_FILE` to point elsewhere, or by following instructions supplied with these installation notes.

Multiple License Files. If your site has software from multiple vendors with incompatible license files (because of different sets of servers), you can keep the data in separate files and set the `MSC_LICENSE_FILE` variable to reference multiple files using a separator character between file names; Windows it is a semicolon (";").

Alternate License Files. In some instances, it can be useful to switch between two license files. For example, if you have a laptop computer, you may want to alternate between use of a concurrent license and a node-locked license. In this way you can minimize the number of licenses required while connected to the network, yet use a single node-locked license when traveling. A method for switching between two license files is provided using the following two environment variables:

`USE_ALT_EASY5_LICENSE`	= *Boolean flag*
`ALT_EASY5_LICENSE`	= *Path to alternate Easy5 license file*

When `USE_ALT_EASY5_LICENSE` is set, Easy5 uses the alternate license file specified by `ALT_EASY5_LICENSE`. Otherwise, it uses the default license file. In this situation, first install Easy5 with the default, preferably node-locked, license. Set the global environment variables `ALT_EASY5_LICENSE` to the alternate license file path and `USE_ALT_EASY5_LICENSE` to `false`. Then, when using the alternate license file, set the latter to `true`.

Application Program

Easy5, an application that employs FLEXlm licensing, is linked with the program module (called the FLEXlm client library) that provides the communication with the license daemons. During execution, the application program communicates with the vendor daemon to request a license.

License Server

Typically, an MSC License Server is installed on a network server to administer the floating licenses within a local area network. The Easy5 program files are then either loaded on individual computers or only on the

network server. For a single or standalone installation, the server is installed on the same machine as the Easy5 application. The server manages the License Manager and Vendor daemons.

Please note that the FLEXlm version of the MSC License Server must be greater than or equal to the FLEXlm version linked into the Easy5 application programs.

Note:	Easy5 2022.3 requires MSC License Server (FLEXlm) v11.13 or greater (installed separately). Easy5 2017 required MSC License Server 11.9, so you may need to update your MSC License Server installation before installing Easy5 2022.3.

A *node-locked* license is used to run Easy5 on a given computer. The number of Easy5 applications running at any given moment is limited by the number coded into the license file. The advantage of this type of license is that no license server program is needed; the licenses are tied to the hardware address of the computer.

License Manager Daemon

The license daemon, usually called `lmgrd.exe` handles the initial contact with the client application programs, passing the connection on to the vendor daemon. It also starts and restarts the vendor daemons. FLEXlm permits multiple redundant license manager daemons on different server nodes, allowing you to make your license available if any two out of three server nodes is running. Also, you do not have to split your licenses among multiple servers or rely on any one machine.

Vendor Daemon

In FLEXlm, licenses are handled by running processes. There is one process, called the vendor daemon, for each vendor that has a FLEXlm-licensed product on the network. Easy5's vendor daemon is called `msc.exe`. The `MSC` daemon keeps track of how many Easy5 licenses are checked out and who has them. Note that the MSC daemon serves many other MSC Software products, including MSC Nastran, MSC Patran, and MSC Adams, among others. If the `MSC` daemon terminates for any reason, all Easy5 users would lose their licenses. Users normally regain their license when the daemon restarts.

Client programs (like Easy5) communicate with the vendor daemon through TCP/IP sockets. This enables client programs and daemon processes to be on separate nodes in a network. The traffic between the client and the daemon is machine independent, which means that any process can run on any machine type or operating system, allowing a *heterogeneous* network.

Note:	If you need to install either or both licensing daemons, you must download and install the software (**MSC Licensing FLEXlm**) from the MSC SimCompanion website at https://mscsoftware.flexnetoperations.com/control/mnsc/index first before installing Easy5.

License Request Process

When the application program calls the FLEXlm client library to request a license, the following process occurs:

1. The license module in the client application finds the license file, which includes the host name and port number of the license manager daemon `lmgrd.exe`.
2. The client establishes a connection with the license manager daemon and tells it what vendor it needs to talk to.
3. The license manager daemon determines which machine and port correspond to the master vendor daemon (if multiple redundant daemons are running) and sends that information back to the client.
4. The client establishes a connection with the specified vendor daemon `msc.exe` and sends its request for a license.
5. The vendor daemon checks to see if any licenses are available and sends a grant or denial back to the client.
6. The license module in the client returns to its caller with the grant or denial, and the application takes the appropriate action.

Configuring FLEXlm

You can configure most FLEXlm parameters by setting

- The location of the license file.
- The location of all executables.
- The location of all log files.
- The TCP/IP port number of clients looking for the license manager.

In addition, you can reserve licenses for specific users, nodes, or groups and control other license-related options.

Getting Started Checklist

As system administrator, you are responsible for setting up licensing on your system or network. If you are an end user of the application and you are not be involved in installing it, then you can skip this section.

In general, installing FLEXlm licensing requires the following steps:

1. Select your license server nodes and get their hostids.
2. Send the hostids to your MSC license administrator and obtain a license file (or the data to enter in the license file) in return.
3. Determine how the new license file relates to any other license files that may already be on your system, and install it appropriately.
4. Start `lmgrd` (the license daemon) manually, or set it up to run automatically at startup, using the separately installed software (MSC Licensing FLEXlm) on the server.

License Servers and Hostids

Before running any FLEXlm-licensed program using floating licenses, you must set up your license server node or nodes. You must select which node or nodes to run your license servers on and provide the `hostid` of those machines to Easy5.

When you install Easy5, the installation script automatically obtains the proper `hostid` (required by FLEXlm license manager) for your machine and displays it during the installation procedure. However, if at any time you need the proper `hostid` of your machine, you can use the following methods:

From the Start menu, Under Search Programs and Files, enter `cmd`. This will bring up a Windows DOS shell. In the shell, type

```
ipconfig /all
```

Scroll up in the resulting printout, and find the entry

```
Ethernet adapter Local Area Connection
```

Under this entry, the hostid is given as the Physical Address. Remove the hyphens before using. An example:

```
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Intel(R) 82567LM Gigabit Network
   Physical Address. . . . . . . . . : 00-23-E8-9D-BC-17
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::b45d:fc18:d862:487b%10(Preferred)
   IPv4 Address. . . . . . . . . . . : 182.151.1.64(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : Friday, May 15, 2015 7:57:54 AM
   Lease Expires . . . . . . . . . . : Saturday, May 16, 2015 7:57:54 AM
   Default Gateway . . . . . . . . . : 182.151.1.1
```

The hostid is then 0023E89DBC17.

Note:	If you have multiple network cards installed, you can have more than one MAC address. You should use the *primary* MAC address.

After sending the `hostid` of your server machines to MSC Software support, the support staff will send you a license file that enables the application software.

Once you have received a license file, you must install it on your system and start up the license server.

- If you have multiple FLEXlm-licensed products, take care to avoid licensing conflicts.
- Easy5 has a default location in the *<host_directory>/easy5/lmgr* subdirectory for your license file. However, you can use any location you wish.
- Some vendors provide special scripts to start up the license daemon. If not, you can run the `lmgrd` program directly. To automatically run `lmgrd` at startup, you must modify your system files. See the directions with the MSC License FLEXlm product.

Testing Your TCP/IP Connection

Easy5 concurrent license management require that you are able to establish a TCP/IP network connection between your computer and the License Server. First, you need to know the `hostname` of the License Server. To determine the appropriate `hostname`, examine the existing concurrent license file and look for the `SERVER` command line. The first argument is the `hostname`. You can test if your computer can communicate with the License Server by entering the command

```
ping hostname
```

in a `Command Shell` where `hostname` is the name of the computer running the License Server. If you get a return reply, then you have a TCP/IP connection established.

Internet Domain Name Server (DNS)

In addition to establishing a TCP/IP network connection between your computer and the License Server, the License Server host (computer name) needs to be found by your internet domain name server (DNS). If the host computer is inside a local-area-network (LAN) this is often automatic. If the host is not registered, you may need to add it to your /etc/hosts or equivalent file.

Updating Your License

One of the most commonly performed license management tasks is updating the Easy5 license. Typically, this is required at least once a year for security purposes. When the license will expire in less than 45 days, you are informed how many days are left in your license every time Easy5 is executed. This information is displayed in a pop-up dialog, as well as in the **Licensed Features** dialog. You will usually be contacted before your license expiration date for arrangements and instructions for renewing your license. If not, please contact MSC Software Licensing.

For floating licenses, the License Server must be updated with the (new) license before it can be used by Easy5. Do **not** overwrite the existing license file, located in the Easy5 `lmgr` folder. If needed, the installation program does this for you. Verify that the license has a valid path for the `DAEMON` line, and a valid `SERVER` hostname in the license file. The `DAEMON` line should have a path to the installed MSC.exe vendor daemon, normally found in folder:

```
C:\MSC.Software\MSC.Licensing\11.x
```

The `DAEMON` line should look similar to the following:

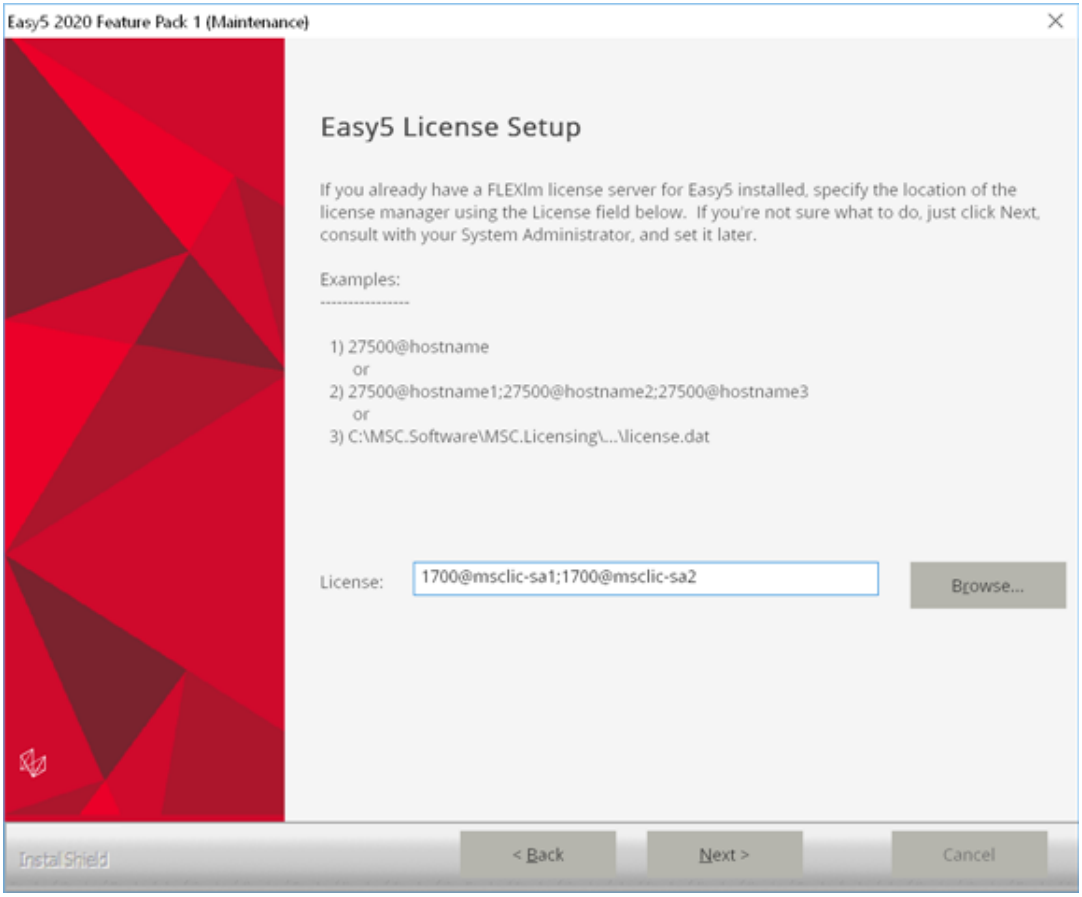
```
DAEMON MSC C:\MSC.Software\MSC.Licensing\11.x\msc.exe
```

If the path to the daemon is incorrect, edit the license file and correct the path. The `SERVER` line should look similar to:

```
SERVER <hostname> <value> <port>
```

where	*<hostname>= the hostname of the computer acting as the license server*
	<hostid>= the hostid of the license server computer
	<port> = the port number (default = 1700)

1. If your license is a **new or updated *floating* type**: Use the appropriate MSC Licensing shortcut and follow the email instructions provided with your license file provided by MSC. See the *MSC Licensing User Guide* for details.
2. If your license is **node-locked** or is a **previously installed floating license then you will need to perform a maintenance update on your Easy5 installation.**
   - Go to the Windows 10 "**Apps & Features**" control panel.
   - Select the appropriate Easy5 installation.
   - After the installer is started, select "**Maintenance**".
   - Enter the new licence information in the License dialog box.



Using a Previously Installed Concurrent License

Two methods are described below to utilize a previously installed concurrent license when installing Easy5 on a particular computer. Both methods require a TCP/IP connection between your computer and the License Server. See the previous sections for information on testing this connection.

To use the following methods, the concurrent license must already be successfully installed on another computer.

Method 1: Linking an Installed Concurrent License File by its Network Address

Set the value of the environment variable `MSC_LICENSE_FILE` in your .cshrc or the System Environment Variables using the *`port@hostname format`*.

With this method, unless you know the correct port@hostname string, you may need to examine the existing concurrent license file. There should be at least one `SERVER` line of the form:

```
SERVER hostname hostid port
```

Note the values for *`hostname`* and *`port`*, which are required to describe the license file managed by the license server.

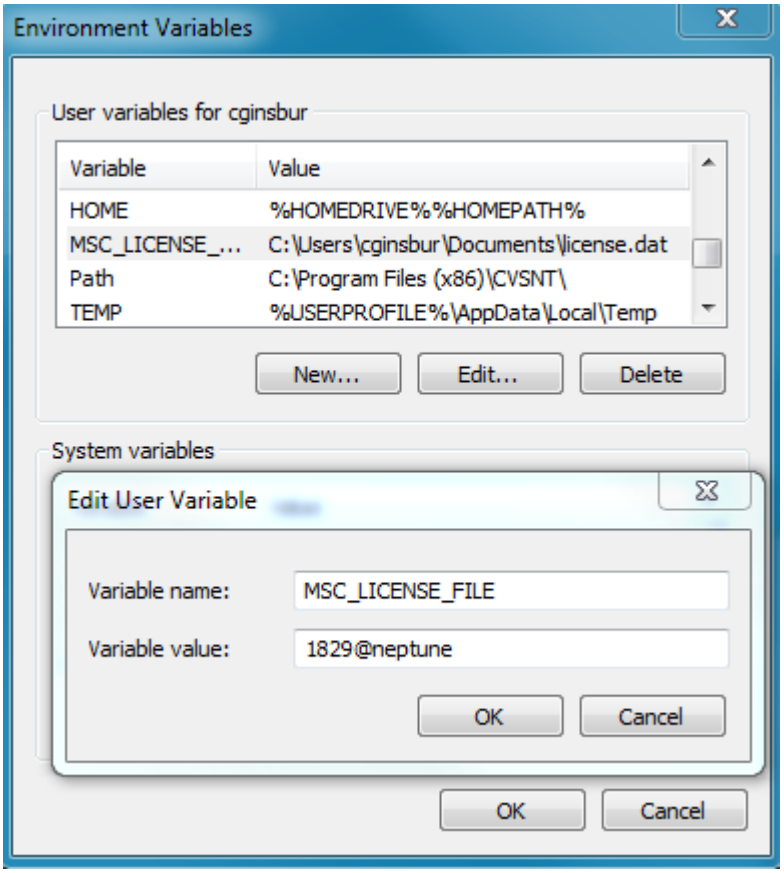
Method 1 Example

An examination of the previously installed concurrent license file indicates a SERVER line as follows:

```
SERVER neptune 0d87242d 1829
```

To use this license file when installing Easy5 on a particular computer

Enter `1829@neptune` as the value of the environment variable MSC_LICENSE_FILE:



Method 2: Installing a Copy of the Previously Installed Concurrent License File

Easy5 does not actually need to be able to "point to" the existing concurrent license for license management purposes; this is simply so that the installation program can read the license file without making a copy of it locally.

The installation program reads the license file not for license management purposes but to correctly determine components for installation. Easy5 only needs to be able to communicate via TCP/IP with the License Server wherever it may be installed on the network.

This method consists of copying the ***previously installed*** concurrent license file to a suitable folder on the computer where Easy5 is to be installed.

Note:	A "previously installed" concurrent license means a license with a valid `SERVER` and `DAEMON` line that it is already hosted by an existing, and running license server.

The installation program copies the license file into the local Easy5 license manager folder. Then, when Easy5 is started, the license file points to the appropriate License Server on the network. In this case, the only information needed is the License Server `hostname`.

1. Copy the existing concurrent license file from the computer hosting the License Server to the local computer. Please do not copy the license file directly to an Easy5 program folder path, especially the **lmgr** subfolder.
2. Either begin a Easy5 installation by loading the CD or executing the installation file, or, if Easy5 has already been previously installed, go to **Start > Programs > Easy5 2022.3 > License > License Update**.
3. When prompted for the license file folder, enter the appropriate local path for the copied concurrent license file. Easy5 Setup always searches the default path `C:\license` first.
4. When Easy5 Setup is done, Easy5 should be configured to use the previously installed concurrent license on the remote License Server. Confirm this by going to **Start > Programs > Easy5 2022.3 > License > License Manager Status**.

8 Uninstalling Easy5

- Overview 44

Overview

You can uninstall the following Easy5 products from your computer:

- Easy5 2022.3
- Easy5 Client 2022.3

Important:	Before uninstalling Easy5, verify that you are not running any Easy5 applications by checking your Task Bar. Uninstalling an application that is running can cause strange behavior later (especially if reinstalling the same software again later).

To uninstall Easy5 products from your computer, use the following method:

1. Go to **Start** > **Control Panel** > **Programs** > **Uninstall a program**.
2. Select the product name of the program you want to uninstall and click **Add/Remove**.

9 Running MSC Adams and Easy5 Together

- Installing the MSC Adams Controls Extension 46

Installing the MSC Adams Controls Extension

Note:	The combination of Easy5 2022.3 and Adams 2022.3 has been tested and verified. **Other MSC Adams versions may or may not work with Easy5 2022.3.**

Installation of the Adams Controls Extension is performed automatically if Adams is previously installed, and you answer **Yes** to the installer prompt asking you to install this component.

To manually install the Adams Controls Extension:

1. Verify that both Easy5 2022.3 and Adams have been installed.
2. Open an Easy5 Command Shell.

Note:	To install the Adams extension into Easy5, you must have permission to add files to and modify files in the Easy5 installation directory. If Easy5 has been installed in C:\Program Files (the default), then you will need to run the Easy5 Command Shell as Administrator. One way to do this is to 1) open a DOS command shell as administrator, 2) execute %EZHOME%\EZ5VARS.BAT, 3) cd to %EZHOME%

At the prompt within the command shell type:

`install_adams_controls.bat` *top-level-Adams-path* `%EZHOME%`

where: *top-level-Adams-path* = Adams path (for example, **C:\MSC.Software\Adams\2022.3**).

The Adams extension installation is now complete.