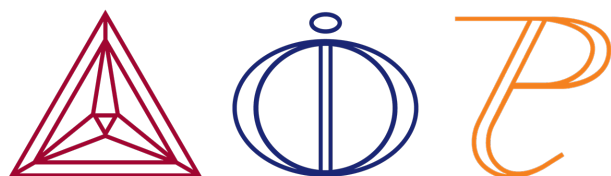


Thermo-Calc Installation Guides

Thermo-Calc Version 2019b



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Installing Thermo-Calc

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System Requirements

A typical installation installs Thermo-Calc and the latest version of the databases.

Additional add-on modules include:

- Diffusion Module (DICTRA)
- Precipitation Module (TC-PRISMA)

You can also install these Software Development Kits (SDKs):

- TQ-Interface (Windows and Linux)
- TC-API (Windows and Linux)
- TC-Toolbox for MATLAB[®] (Windows only)
- TC-Python (all OS)



System requirements and program availability are available on the web:

<https://www.thermocalc.com/products-services/software/system-requirements/>



Also see our roadmap for platform support <https://www.thermocalc.com/products-services/software/system-requirements/platformroadmap/>

Platforms Tested

Thermo-Calc and its components are tested on these platforms:

Windows	Mac	Linux ^{1, 2}
Windows 10 64-bit	Mac OS X Mojave 10.14.5	<ul style="list-style-type: none">• Ubuntu 19.04 (Disco)• CentOS 7.2• OpenSUSE 42.3
<p>¹ Thermo-Calc Software cannot guarantee full functionality if the software is installed on other Linux distributions.</p> <p>² If you are installing on CentOS 7, it is recommended you install glibc before you run the installation script.</p>		





Key to Using this Guide

This installation guide is for all Thermo-Calc installations running on Windows, Mac OS or Linux operating systems. It is also applicable to demo (trial) installations as well as previously installed versions of Thermo-Calc (the new version is installed alongside the old version).

This guide includes information about:

- The types of licenses and installations available.
- Installing the Thermo-Calc software and its components on stand-alone computers, servers and client computers.
- Installing the license management software for network installations.
- Retrieving and installing license files.
- Troubleshooting to solve common installation problems.

ICONS IN THIS GUIDE

Name	Description
Information	 Provides important information and indicates that more detail is located in the linked or named topic.
Note	 The information can be of use to you. It is recommended that you read the text or follow the link.
Operating system	The operating system is indicated when the information is specific to a <i>Windows</i> , <i>Mac OS</i> or <i>Linux</i> operating system.
 License file	The license file, which contains the license keys and is installed on either a standalone computer or a network server.
 Thermo-Calc	The Thermo-Calc software and its components (including databases) to be installed.

TYPGRAPHICAL CONVENTIONS

Convention	Definition
Forward arrow →	The forward arrow symbol → instructs you to select a series of menu items in a specific order. For example, Tools → Options is equivalent to: From the Tools menu, select Options .
Boldface font	A boldface font indicates that the given word(s) are shown that way in on a toolbar button or as a menu selection. For example, if you are told to select a menu item in a particular order, such as Tools → Options , or to click Save .
<i>Italic</i> font	An <i>italic</i> font indicates the introduction of important terminology. Expect to find an explanation in the same paragraph or elsewhere in the guide.
<code>code</code> and <code>code bold</code>	A <code>code</code> font indicates you are to make a keyboard entry. It also shows a programming code or code examples. The <code>code bold</code> font highlights the entry.

Installation Terminology

Term	Definition
client computer	A computer without a license file of its own but connected through the network to a computer with the license information. The client computer receives a license token from the computer where the license management software is installed.
consolidated network	A type of network installation where the Thermo-Calc software and a Thermo-Calc licensing software are installed on a single server computer. This allows all computers in the network to access both the software and a license on the server via a client installation.
distributed network	A type of network installation where the Thermo-Calc software is installed on one server computer in a network and the Thermo-Calc licensing software is installed on a different computer. After a thin client installation, all computers in the network can access both the software and the network license key via the server.
host ID	The MAC/Ethernet Address on the computer that a license is locked to.
license file	The file (called <i>lservrc</i>) that contains all the purchased license keys. It is issued by Thermo-Calc Software, usually by email.
license key	The information contained in the license file that represents the products purchased and which is then authorised for installation.

Term	Definition
License Manager (Windows)	The Windows program used for license management: it distributes license tokens as specified in the network license file issued by Thermo-Calc Software.
License Server (Linux)	The Linux program used for license management: it distributes license tokens as specified in the network license file issued by Thermo-Calc Software.
license server	The use of the term <i>license server</i> (lower case letters) is reserved for use for scripts and option files (for example, in an Unattended Network Client Installations). For the purposes of the step-by-step instructions it is not used to refer to the type of network installation that runs the license management program. Also see <i>License Manager</i> (Windows) and <i>License Server</i> (Linux).
licensing software	The Thermo-Calc license management software. When working in Windows it is called <i>License Manager</i> (full name is Sentinel RMS License Manager by SafeNet) and on Linux it is called <i>License Server</i> (full name is Sentinel License Sever by Safenet).
Network License (NWL)	<p>The license type used with the licensing software. The NWL can only be used on one specific computer that hosts the licensing software. The Network License uses information about IP addresses and IP ranges to determine which client computers receive license tokens.</p> <p>The software may be used on the number of sites you have paid for and by the number of persons you have paid for on any number of network connected computers</p>
standalone computer	A computer which uses a SUNLL license type.
Single-User-Node Locked-License (SUNLL)	A unique license file for one designated computer at one designated site. It cannot be copied or moved outside the site. If the software is installed on a portable computer, it can be temporarily used off-site. The license can be used without network access (to the License Server).
thin client	An installation where the software is installed on a file server but is run from a client computer. The licensing software may be installed on the file server (consolidated network installation) or on a different computer (distributed network installation).
XQuartz	An open-source X Windows System, which is required to run Thermo-Calc on a Mac.

License and Installation Types

In this section:


License and Installation Types	9
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Multi-User Network Installations (NWL)	10

License and Installation Types

Installation procedures are based on the license type, the installation type and the operating system.



Demo (trial) installations: Only a standalone installation is available and a license file is automatically installed.

License type	Installation Type	Windows	Mac OS	Linux
SUNLL	Standalone	Yes	Yes	Yes
NWL	Consolidated network	Yes	No	Yes
	Distributed network	Yes	No	Yes
	License installations on a server network	Yes	Yes ¹	Yes
¹ For Mac OS, the licensing software is installed on a Windows or Linux computer server.  www.thermocalc.com/purchase/licensing-options/				

About License Keys and Files





Demo (trial) installations: A license file is automatically installed with the software. You do not need to request it.

To run Thermo-Calc and its components you need a valid license key for each product. The license keys are included in the license file emailed to you by Thermo-Calc Software.

You can copy the license file to the applicable computer(s) before or after installing the software—the license file itself is not required during the installation process. However, it is required to make calculations in Thermo-Calc.

 [Request a License File from Thermo-Calc Software](#)

Standalone Installations (SUNLL)

The standalone installation is used with the Single-User Node-Locked License (SUNLL). The Thermo-Calc software  and a Thermo-Calc license file  are installed on a standalone computer. You can do a typical (all operating systems) or a custom installation (Windows and Linux only).



▶ To get started, go to [First Steps of Installation](#) and then [Standalone Installations](#).

Multi-User Network Installations (NWL)

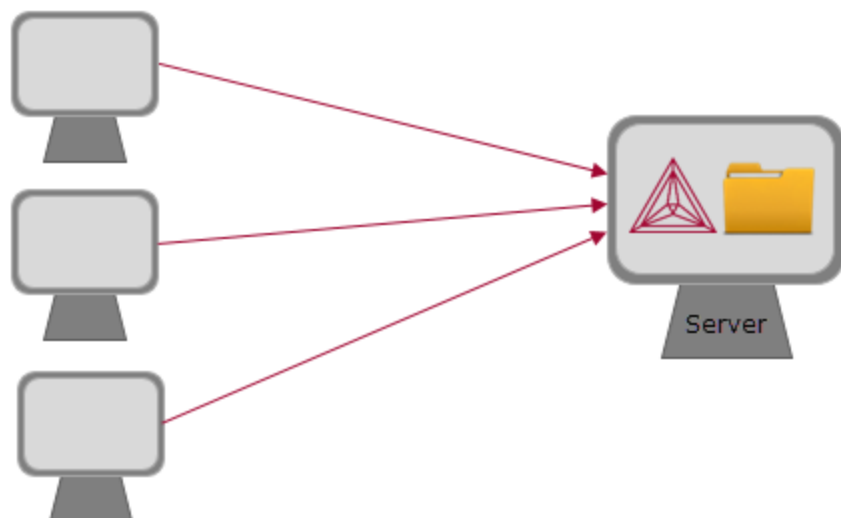
There are different types of multi-user network installations: consolidated, distributed and where the licensing software is installed on a computer network. There is also a subtype of installation called thin client, which is a step done with the consolidated and distributed network installations.





Thin client installations: A thin client installation is where the Thermo-Calc software is installed on a computer server but is run from a client computer. The licensing software can be installed on the computer server (a consolidated network) or on a different computer (a distributed network). This type of installation is available for Windows and Linux operating systems. The client computer must have the Thermo-Calc software installed. This type of installation mainly sets environmental variables and paths on the client computer.

Consolidated Network Installations

The consolidated network installation is used with a Network License (NWL) and it is available for Windows and Linux operating systems.

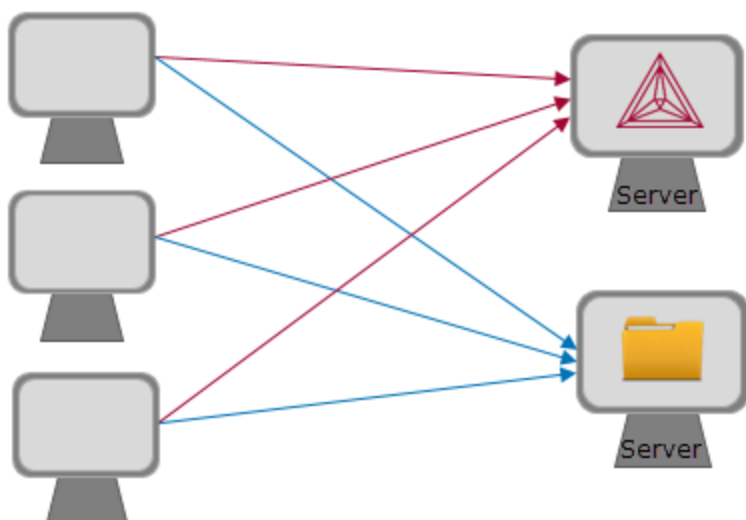




The Thermo-Calc software  and the license management program are installed on the same server where the license file  is also copied. A thin client installation allows all computers (the clients) in the server network to access both the software and the licensing on the same computer server.

► To get started, go to [First Steps of Installation](#) and then [Network Client Installations](#).

Distributed Network Installations

The distributed network installation is used with a Network License (NWL) and is available for Windows and Linux operating systems.

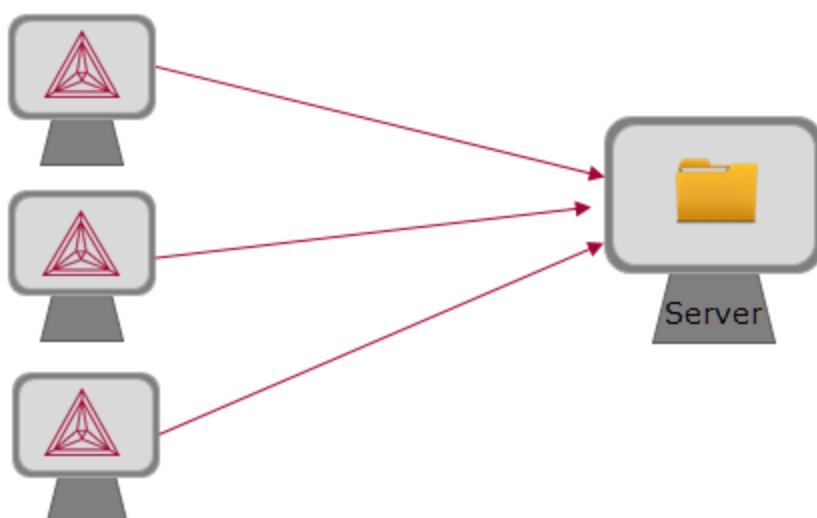




The Thermo-Calc software  is installed on one computer server in a network and the licensing software is installed on a different computer server where the license file  is also copied. A thin client installation allows all computers (the clients) in the server network to access both the software and the licensing on the two computer servers.

▶ To get started, go to [First Steps of Installation](#) and then [Network Client Installations](#).

License Installations on a Server Network

When a license file is installed on a server network, it is used with a Network License (NWL). It is available for all platforms. However, for Mac OS the server containing the licensing software must be set up on Windows or Linux.



The licensing software is installed on a computer server where the license file  is also copied. The Thermo-Calc software  is installed on every computer in the network that needs it.

▶ To get started, go to [First Steps of Installation](#) and then [Network Client Installations](#).

Preparing for Installation

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First Steps of Installation

This section reviews some of the things you need to do before installing the Thermo-Calc software.

- Learn about the default directories where the software and license files are installed.
- For network installations, collect subnet information.
- For Mac, install XQuartz and make sure the security preferences are set correctly.
- For a Linux Cent OS 7 installation, also install gtk2 before you run the installation script.

```
yum install gtk2
```



Should I get my license file before or after software installation? The license file itself is not required during the installation process (and not at all for demo installations). However, it is required to make calculations in Thermo-Calc. The license file has details about your computer(s) that in some cases cannot be determined accurately until *after* installation (especially for a network installation). For most users it is recommended you request the file before you start installing.

Default Directory Installation Locations

The default directories where the software and its components are installed, including where the license file is stored, vary by platform and user type.



If you want to select specific components to install or if you want to install the software in a non-default installation directory, then do a custom installation (Windows and Linux only). In the table, <user> stands for the user name and <version> for the version of Thermo-Calc, for example 2019b.

Thermo-Calc Default Directory Locations

LICENSE FILE - ALL OPERATING SYSTEMS




















The license file is installed outside of the installation program folder. If you have more than one version of Thermo-Calc installed then there will be additional folders here and one license file.

The example below is for a Windows installation.

> This PC > OS (C:) > Program Files > Thermo-Calc >	
Name	Date modified
 2019b	2019-05-27 10:42
 lservrc	2019-05-21 12:42

On a Mac the license file is put in /Users/Shared/Thermo-Calc.

WINDOWS

Windows user type	Default directory							
Administrator	<p>The Thermo-Calc program is installed here:</p> <pre>Program Files\Thermo-Calc\<version></pre> <p>The documents, materials, examples and other folders that sometimes require additional licenses are installed here:</p> <pre>C:\Users\Public\Public Documents\Thermo- Calc\<version></pre> <div><table><thead><tr><th>Name</th></tr></thead><tbody><tr><td> Examples</td></tr><tr><td> Manuals</td></tr><tr><td> Materials</td></tr><tr><td> ProcessMetallurgyMaterials</td></tr><tr><td> PropertyModels</td></tr><tr><td> SDK</td></tr></tbody></table></div> <p>A copy of the documents, materials, examples and more are then placed here:</p> <pre>C:\Users\<user>\Documents\Thermo- Calc\<version></pre> <div><div></div><div>It is recommended that you work with the files that are copied to the <i>user</i> folder.</div></div>	Name	 Examples	 Manuals	 Materials	 ProcessMetallurgyMaterials	 PropertyModels	 SDK
Name								
 Examples								
 Manuals								
 Materials								
 ProcessMetallurgyMaterials								
 PropertyModels								
 SDK								
License software installations on a server network (the License Manager software)	<pre>C:\Program Files (x86)\Common Files\SafeNet Sentinel\Sentinel RMS License Manager\WinNT\</pre>							

MAC

Mac user type	Default directory
Administrator (user name and password required)	<p>The Thermo-Calc program is installed here in the Applications folder:</p> <pre>Thermo-Calc-<version>.app, Thermo-Calc-<version>-Demo.app, and, uninstall-Thermo-Calc-<version>.app</pre> <p>The documents, materials, examples and other folders that sometimes require additional licenses are installed here:</p> <pre>/Users/Shared/Thermo-Calc/<version></pre> <p>To go to this folder, in Finder, from the Go main menu select Go to folder. Enter the above file path and click Go.</p>

LINUX






Linux user type	Default directory
Non root user	<p>The Thermo-Calc program including the documents, materials, examples and other folders that sometimes require additional licenses are installed here:</p> <pre>home/<user>/Thermo-Calc/<version></pre>
Root user	<p>The Thermo-Calc program including the documents, materials, examples and other folders that sometimes require additional licenses are installed here:</p> <pre>opt/Thermo-Calc/<version></pre>
License software installations on a server network (the License Server software)	<p>If you are doing a network installation then these files are available as a tar-file from the Thermo-Calc Software web site.</p> <p>In the downloaded tar-file, there is a restart_lserv script file, which can be used as a template for creating a script that starts up the License Server.</p>

DATABASES

Depending on the type of license and operating system, the encrypted Thermo-Calc databases and the database initialization file (Windows `tc-initd.tdb`; Linux/Mac `initd.tdb`) are located in a subfolder to the Thermo-Calc installation. For example, in a Windows standalone

installation, you can find these in a folder called **data** (file path is *C:\Program Files\Thermo-Calc\<version>\data*).

» This PC » OS (C:) » Program Files » Thermo-Calc » <version> » data

Name	Type
 tc_initd	Thermo-Calc TDB file
 STANDARD_DB_CLASSES.BIN	BIN File
 TCTI2	File folder
 TCTI1	File folder
 TCSLD3	File folder

TC-TOOLBOX FOR MATLAB

Examples for the TC-Toolbox are placed under MATLAB in the same documents folder as the Thermo-Calc files (Documents folder):

```
..\Documents\MATLAB\Thermo-Calc-Toolbox-X\Examples
```

Where *X* is the installed version number of the toolbox.

For most installations the examples are available in the MATLAB window when the software is opened.

DATABASE CHECKER PROGRAM

The Thermo-Calc software package includes a program to check that the syntax of unencrypted database files is correct. The program applies the syntax rules set out in the *Database Manager User Guide* and reports errors and issues warnings. This program is intended for advanced users who develop and manage databases.



Thermo-Calc accepts deviations from these syntax rules. This means that a database can work even if the Database Checker reports errors and warnings. For example, an error is reported if an abbreviated phase name is found, but phase name abbreviations are accepted by Thermo-Calc and its add-on modules.

The executable **DatabaseChecker** file is found in the Thermo-Calc home directory. The program can also be launched by selecting **Tools→ Database Checker** from the main menu.

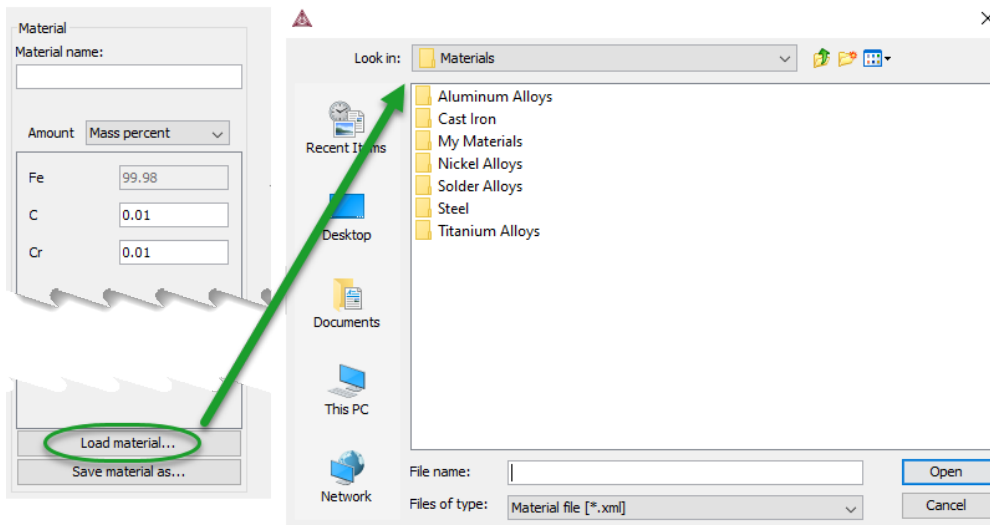
MATERIALS

When you are working with the System Definer you can open the default **Materials** folder included with your installation.

At the bottom of the window under **Material**, click **Load material** to navigate to a material file.



There is a separate folder for materials saved using the Process Metallurgy Calculator. See [Default Directory Installation Locations](#).



The default directory where these files are stored is based on operating system:

Operating system	Materials installation directory
Windows	C:\Users\<user>\Documents\Thermo-Calc\2019b\Materials
Linux	On Linux all user files are installed where the program is installed. If installed as root the default is: opt/Thermo-Calc/2019b/Materials
Mac	/Users/Shared/Thermo-Calc/2019b/Materials

CUSTOM PROPERTY MODELS



All property models (whether these are predefined or custom models) must be



located in a subdirectory of the property model directory. You can go to **Tools → Options** and the **Model directory** field displays the default directory.

Predefined models included with the Property Model Calculator are installed in the locations below based on your operating system. If you create your own models, this is the default directory where these are saved. You can also use one of these as a template to create your own property model.

Operating system	Property model installation directory
Windows	C:\Users\<user>\Documents\Thermo-Calc\2019b\PropertyModels
Linux	On Linux all user files are installed where the program is installed. If installed as root the default is: opt/Thermo-Calc/2019b/PropertyModels
Mac	/Users/Shared/Thermo-Calc/2019b/PropertyModels

PROCESS METALLURGY MATERIALS

With the Process Metallurgy Calculator you can save materials to work with again. This is the default folder where these are stored based on your operating system:

Operating system	Process Metallurgy Materials installation directory
Windows	C:\Users\<user>\Documents\Thermo-Calc\2019b\ProcessMetallurgyMaterials
Linux	On Linux all user files are installed where the program is installed. If installed as root the default is: opt/Thermo-Calc/2019b/ProcessMetallurgyMaterials
Mac	/Users/Shared/Thermo-Calc/2019b/ProcessMetallurgyMaterials

Subnet Information for Network Licenses

For network licenses, the subnet information is also required. Contact your company's network administrator for help as required. Additional requirements are included elsewhere for network installations.

- Subnets should be in the format `aaa.bbb.ccc***` (for example: `192.168.29.0/24` or `192.168.29.*`)
- A maximum of six subnets are permitted.
- An alternative way to get this information is to run the command:
- *Windows:* `ipconfig /all`
- *Mac / Linux:* `ifconfig`

Mac OS Installation Notes

RESTARTING AFTER AN INSTALLATION

In some types of installations (e.g. a network installation), you may have to restart your Mac to use Thermo-Calc for the first time.

INSTALLING XQUARTZ

The XQuartz open-source X Windows system is required to run Thermo-Calc on Mac OS X but it is not required to install Thermo-Calc. Before installing Thermo-Calc, you may also need to ensure that the computer security permissions are set.

1. In a web browser go to <https://www.macupdate.com> or to download it directly from XQuartz, <http://xquartz.macosforge.org/landing/>.
2. In the **Search Mac Apps** field, enter *XQuartz*.
3. Click the **XQuartz** search result. For example, based on the recent version, the name is *XQuartz-2.7.7.dmg*.
4. Click **Download**.
5. Double-click the **XQuartz.pkg** file. Follow the instructions.
6. Click **OK** when the message about logging out displays and click **Close** when the installation is successful.

ENABLING THE SECURITY SETTINGS

1. From the Apple main menu, select **System Preferences**.
2. Click **Security and Privacy**.
3. Click **General**. At the bottom of the **Security & Privacy** window, click the lock icon to make changes. Enter the administrator password as required.
4. If you have already tried to launch the Thermo-Calc installer, you can click **Open Anyway** to proceed. Otherwise, under **Allow apps downloaded from:** click **Anywhere** and then **Allow from Anywhere**.
5. Continue with the applicable installation type (standalone or network).



Remember to reset your security after installing Thermo-Calc.

Linux Installation Notes

The following are details you need to know regarding your Linux installation as well as how to open Thermo-Calc.

openSUSE Administration (sudo) Users

Note the following if you are a sudo user (administrator) in openSUSE installing Thermo-Calc using this command:

```
sudo ./linux-installation-x64-6.0.0.17347.run
```

When this command is used, you will do a text-based installation instead of having a graphical interface to guide you. The information is the same, just without the user interface.

Opening Thermo-Calc in Linux

To open Thermo-Calc double-click the **Thermo-Calc-2019b** application or from the Thermo-Calc installation directory enter `$./Thermo-Calc-2019b.sh` in the terminal.

Standalone Installations

You can either do a typical or a custom standalone installation. The license type is called a Single-User Node-Locked License (SUNLL).

In this section:

Typical Standalone Installations	23
Add New Components to an Existing Installation	26
Custom Standalone Installation	26

Typical Standalone Installations

The following describes a typical standalone installation. These steps assume you have completed the section [First Steps of Installation](#).

Request your license file from Thermo-Calc Software



Demo (trial) installations: Skip this step. A license file is automatically installed with the software. You do not need to request it.



Updates to Thermo-Calc: Customers who subscribe to the annual maintenance plan can skip this step if you have received your license file in an email from Thermo-Calc Software AB. Save the license file to your computer to use during software installation. The license file name must be the same as the existing file name to ensure there are no errors during the update.

Follow the instructions for your operating system in the section [Request a License File from Thermo-Calc Software](#).

Download your Thermo-Calc installation software

- *Web downloads:* For web links sent in an email from Thermo-Calc Software, go to the URL and log in with the information provided to download the software.
- *DVD installations:* Insert the DVD and follow the instructions.

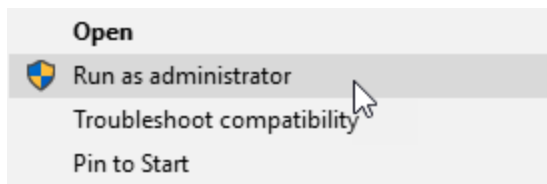
Run the applicable installation file for your operating system

1. Navigate to the folder for your operating system and click the link to download the software package, then go to the folder where you downloaded the software.



Administrative rights are required for Windows and Mac installations.

- *Windows:* Right-click the **.exe** file and choose **Run as administrator** to launch the **Setup** program.



- *Mac*: Double-click the zip file then follow the instructions.
- *Linux*: To start the Setup Wizard in a Terminal window, enter these commands in the directory where the installation file is saved:

```
> chmod +x linux-installation-x64-2019b.run  
> ./linux-installation-x64-2019b.run
```



If you are an openSUSE root user, see [Linux Installation Notes](#) for some information about your installation.

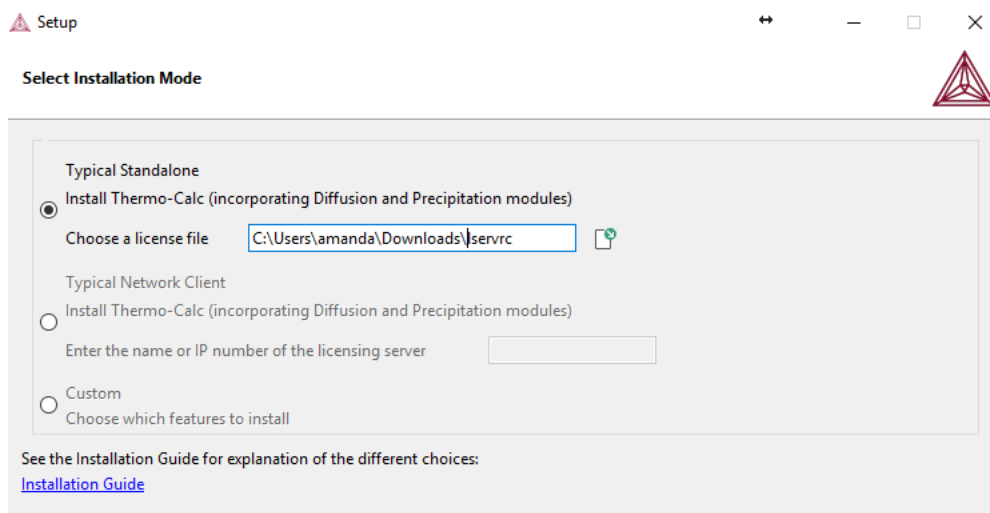
2. On the **Setup-Thermo-Calc** window click **Next**.
3. On the **License Agreement window** click to accept the license agreement.
4. Click **Next**.




Demo (trial) installations: Your installation starts and is done when the **Completing the Thermo-Calc Demo Setup Wizard** opens. Click **Finish** and start using Thermo-Calc.

Select the installation type and upload the license file

1. In the **Select installation mode** window click **Typical Standalone → Install Thermo-Calc (incorporating Diffusion Module (DICTRA) and Precipitation Module (TC-PRISMA))**.



2. In the **Choose a license file** field enter the path to your license file (called **lservrc**) or click the file button  to navigate to a location on the computer (for example, where you saved it). Click **Next**.



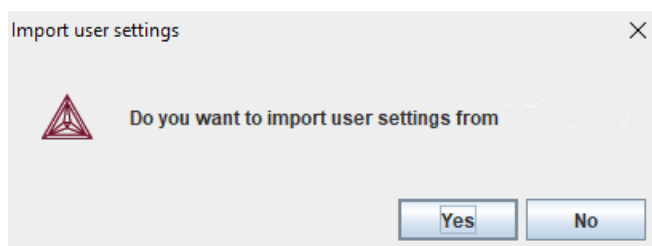
To prevent errors, leave this field blank if you did not get a license file yet.

Install the software and start using Thermo-Calc

1. In the **Ready to Install** window click **Next**.
2. Click **Finish** and start using Thermo-Calc. For Linux users, log out and log back in to finish the installation and start using Thermo-Calc.



Mac OS installations and if you have previous Thermo-Calc installations:
When you launch Thermo-Calc with the new or updated version, the splash screen hides the **Import User Settings** dialog box. In order to proceed you need to click the splash screen and then click **Yes** or **No** in the dialog box.





If you did not get your license file see [Request a License File from Thermo-Calc Software](#).

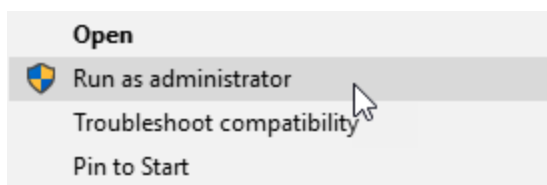
Add New Components to an Existing Installation

If you want to add new components to an existing Thermo-Calc installation (for example, you purchased a license for TC-Python), run the executable (Windows) or binary (Linux) installation file again as in Step 3 of [Typical Standalone Installations](#). This is not available for Mac.



Administrative rights are required for Windows and Mac installations.

1. Right-click the executable Thermo-Calc installation **.exe** file and choose **Run as administrator** to launch the **Setup** program.



2. Click **Next**.
3. Click to accept the license agreement. Click **Next**.
4. Select the additional component(s) to install. Click **Next**.
5. Click **Next** to start the installation, which adds the new component(s).



Use the **Uninstall** program to *remove* components.



[Uninstalling Thermo-Calc](#)

Custom Standalone Installation

This topic describes how to do a custom installation on a standalone computer for either a Windows or Linux operating system. These steps assume you have completed the section [First Steps of Installation](#).

Complete Steps 1 to 4 of a typical standalone installation

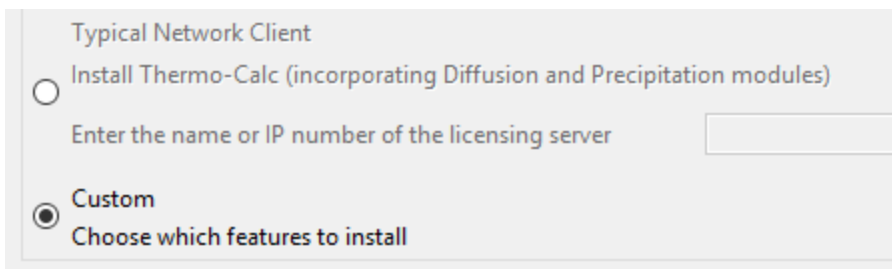
Follow the instructions for [Typical Standalone Installations](#) to get your license file and to download and run the software.

Select the installation type and what components to install

1. On the **Select installation mode** window, click **Custom**. Click **Next**.



The option appears greyed out, but it is available to select.



2. Set up the Desktop shortcuts.

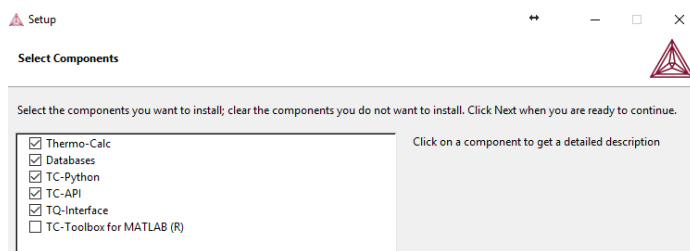
For *Windows*, in the **Specify Configuration** window, the **Create Shortcuts on Desktop** check box is selected. Click **Next**.

For *Linux*, and if you are installing as a non-root user, by default, the **Create Shortcuts on Desktop** check box is selected. Click **Forward**.

3. In the **Select Components** window, click to select what you want to install. Click **Next**.



Additional licenses are required to run TC-Python, TC-API, TQ-Interface, TC-Toolbox for MATLAB (Windows only) and some of the Databases. For the add-on Diffusion Module (DICTRA) and/or Precipitation Module (TC-PRISMA) some elements are included with the demonstration databases but a separate license is required for full functionality.



Set the installation directory path, license file location and shortcuts


1. In the **Installation Directory** window, either accept the default path or enter a path to where you want to install the software (see [Default Directory Installation Locations](#)).

Click the file button  to navigate to another directory. Click **Next**.


Setup

Installation Directory

Please specify the directory where Thermo-Calc will be installed.


Installation Directory 

For the Windows TC-Toolbox for MATLAB® component, and if you get a **MATLAB not found** message, enter the MATLAB installation directory and click **Next**.

2. In the **Choose Setup Type** window, click **Standalone**.
3. In the **Choose a license file** field enter the path to your license file (called **lservrc**) or click the file button  to navigate to a location on the computer. Click **Next**.




To prevent errors, leave this field blank if you do not have a license file yet.

 Setup

Choose Setup Type

Select one of the following setup types.
See installation guide for detailed description of the choices.

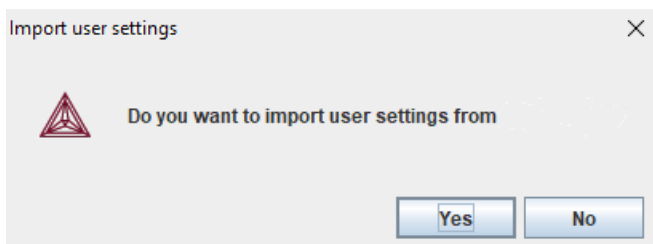
☐ Standalone
☒ Choose a license file 
☐ Network Client
☐ Enter name or IP number of the licensing server

Install the software and start using Thermo-Calc

1. In the **Ready to Install** window click **Next**.
2. When the installation is complete, click **Finish** and start using Thermo-Calc. For Linux users, log out and log back in to finish the installation and start using Thermo-Calc.



Mac OS installations and if you have previous Thermo-Calc installations: When you launch Thermo-Calc with the new or updated version, the splash screen hides the **Import User Settings** dialog box. In order to proceed you need to click the splash screen and then click **Yes** or **No** in the dialog box.



If you did not get your license file see [Request a License File from Thermo-Calc Software](#).

Network Client Installations

This installation type is available for Windows and Linux. It is applicable to the consolidated and distributed network types of installations as well as for the licensing installation on a server network.

- Do a *Typical Network Client* installation if you only want to install the Thermo-Calc program (including Diffusion Module (DICTRA)) and Precipitation Module (TC-PRISMA)) and databases.
- Do a *Custom* installation if you want to select specific components to install or if you want to install the software in a non-default installation directory.

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Typical Network Client Installations

The following outlines how you do a typical network client installation.

Install the licensing software

Follow the instructions for your operating system:

- Set Up the License Manager on Windows, or
- Set Up the License Server on Linux

Complete Steps 1 to 3 of a typical standalone installation

Follow the instructions for [Typical Standalone Installations](#) to download and run the software. It is up to you whether you get the computer information for the license files before or after installing the software.

Choose the installation type and enter the computer server details

1. Click **Typical Network Client** installation to install Thermo-Calc incorporating Diffusion Module (DICTRA) and Precipitation Module (TC-PRISMA).



The option appears greyed out, but it is available to select.

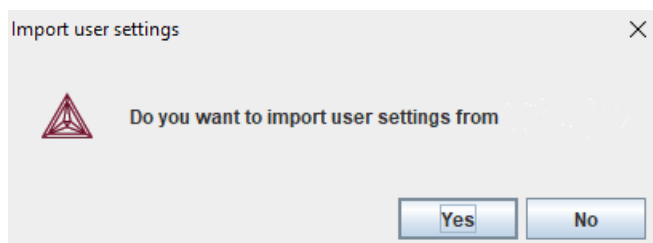
2. In the field, enter the name or IP number of the computer where the licensing software is installed. Click **Next**.

Install the software and components

1. In the **Ready to Install** window click **Next**.
2. When the **Completing the Thermo-Calc Setup Wizard** window opens, click **Finish**.
3. For *Linux* users, log out and log back in to start using Thermo-Calc.



Mac OS installations and if you have previous Thermo-Calc installations: When you launch Thermo-Calc with the new or updated version, the splash screen hides the **Import User Settings** dialog box. In order to proceed you need to click the splash screen and then click **Yes** or **No** in the dialog box.



If you did not get your license file see [Request a License File from Thermo-Calc Software](#).

Set Up the License Manager on Windows



License Manager vs License Server: Both terms refer to the licensing software program installed on a network computer. License Manger is for Windows and License Server is for Linux. See [Installation Terminology](#) for more information.

Installation Requirements

This procedure explains how to install the License Manager on a computer that acts as a license server in your network. It is a Sentinel RMS License Manager Windows service and it supplies the client computers in your network with license tokens when it runs the Thermo-Calc software. A network license can only be used on one specific computer that hosts the License Manager. The network license determines which client computers receive license tokens using their IP addresses and IP ranges.

- For *Mac* installations, the server containing the license file must be set up on a Windows or Linux computer.
- For testing purposes, and in order to confirm the installation is working correctly, install the Thermo-Calc software on the same computer as the Sentinel RMS License Manager. Thermo-Calc can always be uninstalled after testing if required.
- Administrator rights are required.

Installing the License Manager on Windows

Install the Sentinel RMS License Manager software

1. Follow the instructions to [download your Thermo-Calc installation software](#).
2. Open the directory for Windows and right-click the file **Sentinel RMS License Manager 8.5.1.msi**.
3. Select **Save target as** and choose a suitable directory so that you can easily find the file later.
4. Right-click the downloaded file and choose **Install**. Click **Next**.

Choose the installation directory

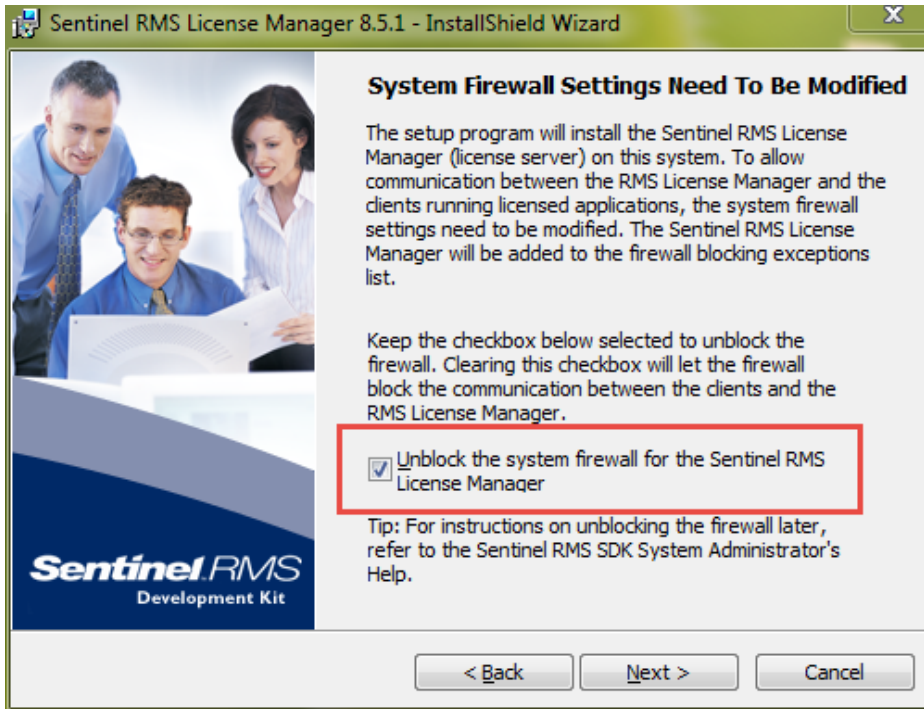
1. Click to accept the license agreement. Click **Next**.
2. Enter your **User Name** and **Organization** and select to install the License Manager for **All users**. Click **Next**.
3. In the **Destination Folder** window click **Next** to accept the suggested destination directory or **Change** to select another directory. Click **Next**.

Choose the setup type and install the software

1. In the **Setup Type** window, select **Complete**. Click **Next**.
2. Select the **Unblock the system firewall for the Sentinel RMS License Manager** check box.



Selecting the check box is required to run Thermo-Calc.



3. Click **Next** and then **Install**.
4. Click **Finish** to exit the InstallShield Wizard.

Copy the license files to the destination directory

Copy the network license file to the destination directory. By default, it is installed in the following directory with the name **lservrc**.

```
C:\Program Files (x86)\Common Files\SafeNet Sentinel\Sentinel RMS  
License Manager\WinNT\
```



The name of the **license file** must be in lower case letters (**lservrc**). This is especially important if both Windows and Linux operating systems are part of your network; Linux commands and operations are case-sensitive.

If the default file path does not work, you can set the environmental variable **LSERVOPTS** to select the license file:

- a. In the Windows **Control Panel**, go to **System** → **Advanced system settings**.
- b. In **System Properties** select **Advanced** → **Environment Variables** → **New**.

- c. Enter the **Variable name** LSERVOPTS to specify the parameters with which the License Manager is started.
- d. To specify the path to the license file in the **Variable value** field enter the following and include the complete license file path and name.

```
-s <license file path and name>
```

Reboot or restart the license manager

Set Up the License Server on Linux



License Manager vs License Server: Both terms refer to the licensing software program installed on a network computer. License Manger is for Windows and License Server is for Linux. See [Installation Terminology](#) for more information.

Installation Requirements

There are a variety of things needed to prepare for a Linux License Server installation. The following points are described in this section.

- You need to stop older versions of the License Server before running the new one. To stop the license server you run **lsrvcdown**.
- Root access to your computer is required or you need to be on the **sudoers** list.
- To run the License Server on a Linux 64-bit computer, you need to install 32-bit library support. For example, on CentOS this can be done by running the command:

```
>yum install glib2.i686
```

- You need a valid **lservrc** network license file supplied by Thermo-Calc Software and the actual License Server—a file(program) called **lserv**.



The name of the **license file** must be in lower case letters (**lservrc**) because Linux commands and operations are case-sensitive.

- The license file need to be read and writable by the license server(license manager)
- If you have a license server; Upgrade your license server if the new one is a higher version than the present one. Clients work with newer license servers(managers) but not necessarily with ones older than client.

OPENSUSE ADMINISTRATION (SUDO) USERS

Note the following if you are a sudo user (administrator) in openSUSE installing Thermo-Calc using this command:

```
sudo ./linux-installation-x64-6.0.0.17347.run
```

When this command is used, you will do a text-based installation instead of having a graphical interface to guide you. The information is the same, just without the user interface.

Installing the License Server on Linux

Stop any older versions of the License Server



Skip this step if this is a new installation.

1. To stop an old version of the License Server that is already running, go to the directory where the old file is found, and enter the commands:

```
>chmod +x <lsvrdown>  
>./lsvrdown <host_name>
```

2. Edit existing scripts that start the older version of the License Server so that they start the newer version instead.



For more information about the **lservdown** utility, go to

<http://sentinelrms.safenet-inc.com/RMSDocumentation/SysAdmin/Content/lservdown.htm>

Write a script to start the License Server

The following is an excerpt from the template script for starting the License Server found in the `restart_lserv` file.

Replace the paths for `LICENSE_SERVER_DIR`, `LICENSE_FILE_DIR` and `LOG_DIR` to match your system. Save it as a script:

```
# set the directory where the executables are located  
LICENSE_SERVER_DIR=/usr/local/Thermo-Calc/2019b/Licensing-files  
# set the directory of the license file lservrc  
LICENSE_FILE_DIR=/usr/local/Thermo-Calc/2019b/Licensing-files  
# set the directory where you wish to save the log-files  
LOG_DIR=/tmp
```

```
# stop the running server
# (omit this line if calling this script at startup)
$LICENSE_SERVER_DIR/lsvrdown $HOSTNAME
# start the license server
$LICENSE_SERVER_DIR/lserv -s $LICENSE_FILE_DIR/lservrc -l $LOG_DIR/lserv_use.log -f
$LOG_DIR/lserv_err.log
```

Confirm the HOSTNAME variable and open the UDP port

1. Before starting the License Server make sure that the value of the \$HOSTNAME variable is correct. This value can be shown by typing the `> nslookup $HOSTNAME` command in the terminal window:

The value should be the same IP address that is shown when you use the `ifconfig` command.

2. Open the UDP port 5093 in your firewall. In case you have installed SELinux you might also need to disable it by setting `SELINUX=permissive` in the `/etc/selinux/config` file.

Start the License Server

1. To start the License Server, run the script created as root. Enter these commands in the console:

```
> chmod +x <name_of_script_file>
> ./<name_of_script_file>
```

2. If you want the License Server to start when you boot the system, put a copy of the start script under `/etc/rc.d/init.d` and start the script from the file `/etc/rc.d/rc.local`.

Thin Client Installations

This topic describes how you install a thin Thermo-Calc client to run Thermo-Calc from a file server. It is applicable to consolidated and distributed network installations for either a Windows or Linux operating system.

INSTALLATION REQUIREMENTS

- You need access to the directory where Thermo-Calc is installed on the file server.
- You need the IP number or name of the computer where the license file is installed.

- For *Linux* you may have to disable your firewall. If SELinux is installed, try disabling it by setting `SELINUX=permissive` in `/etc/selinux/config`.

INSTALLING A THIN CLIENT ON WINDOWS

1. Map the file server share as a network drive so that it gets an assigned drive letter (e.g. **E:**).
2. Open the `\Thermo-Calc\<version>\` directory on the file server, where *version* is the current version of the software.
3. Open the directory **Thin-client**. Double-click the `Thermo-Calc-client-windows-<version>.exe` file.
4. Click to accept the terms of the license agreement. Click **Next**.
5. Enter the name or IP number of where the license file and the License Manager software is installed. Click **Next**.
6. In the **Specify Configuration** window, the default is **Current user only**, meaning the installation is only available for the person logged in and installing the software. Select **All users** to allow anyone using this computer to access Thermo-Calc. By default the **Create Shortcuts on Desktop** check box is selected. Click **Next**.
7. In the **Ready to Install** window, click **Next**.
8. Click **Finish**. To start Thermo-Calc find the program on the server and start it from there.

INSTALLING A THIN CLIENT ON LINUX

1. Add the following to the `smb.conf` file, where *<user>* is your user name:

```
[public]
path=/home/<user>/Thermo_Calc/2019b
public=yes
writable=yes
comment=smb share
guest OK=yes
force user=<user>
```

2. From the client, mount the directory on the server computer that contains the Thermo-

Calc server installation (by default, this directory is called **/Thermo-Calc/2019b**). How the directory is mounted depends on the Linux distribution being used as well as how the Thermo-Calc directory on the server computer is shared. Use the Linux command `mount`. For example:

```
> mkdir public
> sudo mount -t cifs //ip_number_server_computer/public ./public -o
user=<user>
```

3. Open the mounted directory on your computer, and run `client-install-linux-x64.run` or `client-install-linux-x86.run` in the **/Thin-client** directory.
4. If you do this from the terminal window, use the following to start the installation (assuming that the file server is a 64-bit computer):

```
> ./client-install-linux-x64.run
```

5. Click **Forward** and click to select the license agreement. Click **Forward**.
6. Enter the name or IP number of the License Server. Click **Forward**.
7. If you are installing as a non-root user, by default, the **Create Shortcuts on Desktop** check box is selected. Click **Forward**.
8. In the **Ready to Install** window click Forward.
9. Click **Finish**. Log out and log back in to start using Thermo-Calc.

Custom Network Client Installations

This section describes how to do a custom network client installation for Windows and Linux operating systems. The requirements are the same as for a typical client installation.

Install the licensing software

Follow the instructions for your operating system:

- [Set Up the License Manager on Windows](#), or
- [Set Up the License Server on Linux](#)

Complete Steps 1 to 4 of a typical standalone installation

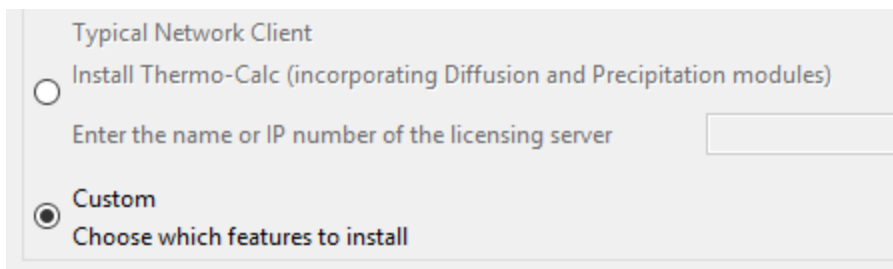
Follow the instructions for [Typical Standalone Installations](#) to download and run the software. It is up to you whether you get the computer information for the license files before or after installing the software.

Choose the installation type and what to install

1. In the **Select installation mode** window click **Custom**. Click **Next**.



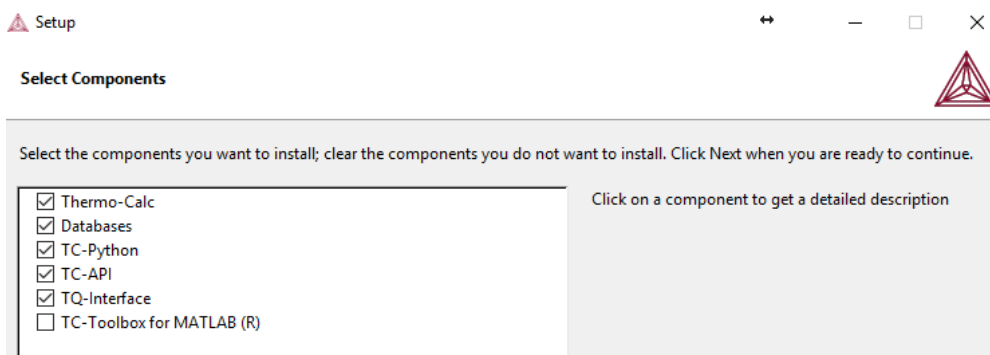
The option appears greyed out, but it is available to select.



2. In the **Select Components** window, choose what you want to install. Click **Next**.

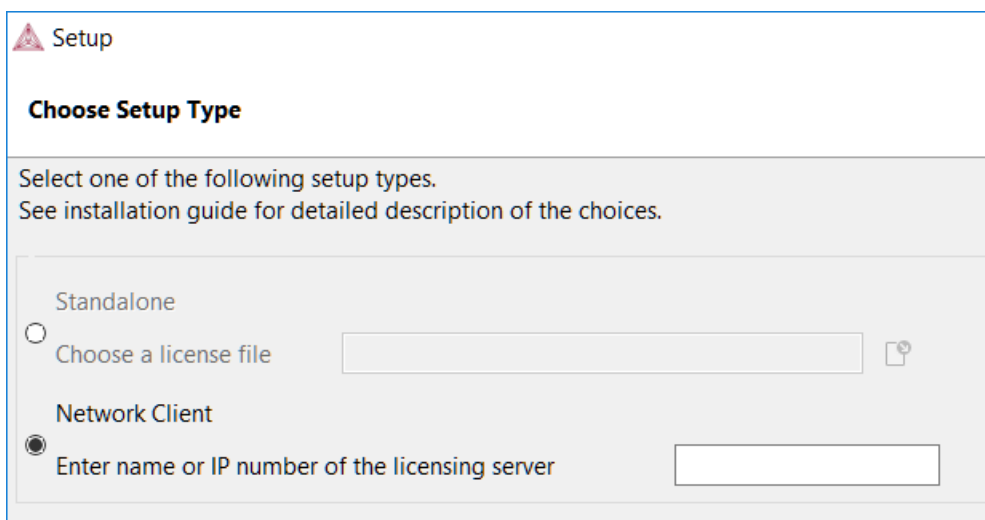
Set the installation directory path to the license file

1. In the **Installation Directory** window, enter the path to an installation directory (see [Default Directory Installation Locations](#)). Click **Next**.



For the Windows TC-Toolbox for MATLAB component and if you get a **MATLAB not found** message, enter the MATLAB installation directory and click **Next**.

2. In the **Choose Setup Type** window, click **Network Client** and enter the name or IP number of the computer where the licensing software is installed. Click **Next**.



Specify the configuration and create shortcuts

For *Windows*, in the **Specify Configuration** window, the **Create Shortcuts on Desktop** check box is selected. Click **Next**.

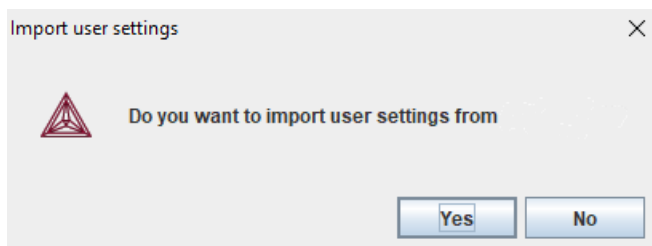
For *Linux*, and if you are installing as a non-root user, by default, the **Create Shortcuts on Desktop** check box is selected. Click **Forward**.

Install the software and start using Thermo-Calc

1. In the **Ready to Install** window click **Next**.
2. When the **Completing the Thermo-Calc Setup Wizard** window opens, click **Finish**.
3. Log out and log back in and start using Thermo-Calc.



Mac OS installations and if you have previous Thermo-Calc installations:
When you launch Thermo-Calc with the new or updated version, the splash screen hides the **Import User Settings** dialog box. In order to proceed you need to click the splash screen and then click **Yes** or **No** in the dialog box.



If you have not got the license file, go to [Request a License File from Thermo-Calc Software](#).

Unattended Network Client Installations



Terminology note: The use of the term *license server* (lower case letters) is applicable to the option files as described in this section. For the purposes of the step-by-step instructions it is not used to refer to the type of network installation that runs the licensing software.

Sometimes it is convenient to install Thermo-Calc network clients without providing user input after the installation is initiated (an unattended network client installation). This is available for Windows and Linux operating systems.



Make sure you know the name or IP number of the computer where the licensing software and the license file are to be installed.

Create an option file in a text editor to enter the options

The following is an example of an option file for a custom network client installation, where *<name/IP number>* is the name or IP number of the computer where the license file is installed and *<MATLAB directory>* is the path to the MATLAB directory (when applicable):

```
installation_mode=custom
setup_type=client
enable-components=thermo,databases,tq,tcapi,toolbox,tcpython
config=all
icons=1
license_server=<name/IP number>
matlab_folder=<MATLAB directory>
```

Below is a shorter example, specifying that a typical Thermo-Calc network client should be installed:

```
installation_mode=typical_client
license_server=<name/IP number>
```

Go to the directory where the installation file is stored



Thermo-Calc can only be installed in unattended mode from the command line prompt.

Start the installation in unattended mode using the option file created with this command:

- For *Windows*: `<installationfile>.exe --mode unattended --optionfile <path\optionfile>`
- For *Linux*: `<installationfile>.run --mode unattended --optionfile <path/optionfile>`

To see other options when you start the Thermo-Calc installation program from the command line prompt, run this command:

- For *Windows*: `<installationfile>.exe --help`
- For *Linux*: `<installationfile>.run --help`

Request License Files

In this section:

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Request a License File from Thermo-Calc Software

The following explains how to retrieve the necessary diagnostic and network adaptor information about your computer and then send an email to Thermo-Calc Software to get your license file(s) containing the license key(s).

To set up the correct licensing (excluding demo installations where a license file is not required):

1. Make a note of your company or organisation's *site number*. You can find the site number on an invoice or any correspondence from Thermo-Calc Software.
2. Retrieve your computer diagnostic and network adapter information.
3. Email Thermo-Calc Software with this information.
4. A Thermo-Calc Software representative emails you the license file. Save the license file **lservrc** (there is no file suffix) to a location where you can easily access it later.

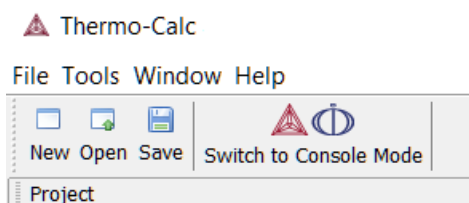
▶ <https://www.thermocalc.com/support/request-support/>

Getting License Information Using Thermo-Calc

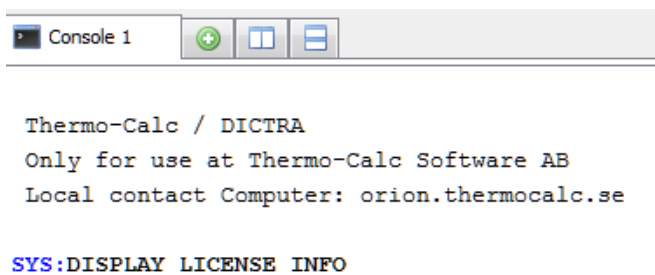
If you have already installed Thermo-Calc, you can view the license information in the GUI. Select **Help** → **Show License Info**.

In Console Mode you can run the SYS module command `DISPLAY_LICENSE_INFO`.

1. Open Thermo-Calc.
2. Click **Switch to Console Mode**.



3. At the `SYS:` prompt, enter `DISPLAY_LICENSE_INFO` (all caps).



```
Thermo-Calc / DICTRA
Only for use at Thermo-Calc Software AB
Local contact Computer: orion.thermocalc.se

SYS:DISPLAY_LICENSE_INFO
```

4. You can output the information to a `FILE` or to the `SCREEN`.

```
SYS:DISPLAY_LICENSE_INFO
OUTPUT TO SCREEN OR FILE /SCREEN/:SCREEN
```

5. For both options, the information is displayed on screen. Copy the section containing the **Ethernet** and **IP address**. You can save it to a text file or paste it directly into an email. If you choose `FILE` as the output, then you can attach the file to an email.

Requesting the License File for Windows or Linux

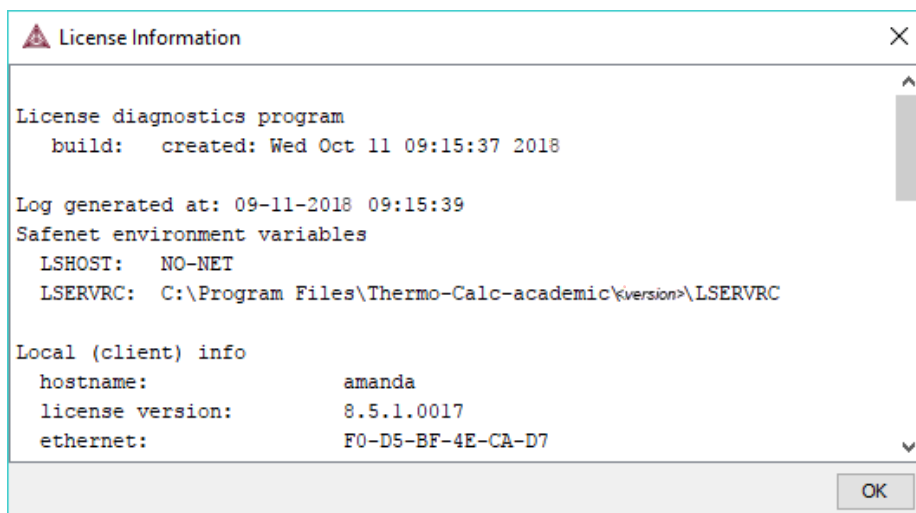


Demo (trial) installations: Skip this section. A license file is automatically installed with the software. You do not need to request it.



Upgrades to a new version of Thermo-Calc: Skip this section if you are upgrading to a new version of Thermo-Calc and (and you have a maintenance plan). Your license is sent to you in an email from Thermo-Calc Software AB. Save it to your computer to use during software installation.

1. To access the computer information you need to provide to get a license, start Thermo-Calc and select **Help → Show License Info**.



2. Copy the information from the **License Information** window. A lot of information may be shown below the initial screen, so make sure you scroll down to the end when you select and copy the window's contents. (Alternatively, you can copy the same information from the console by using the SYS module command `DISPLAY_LICENSE_INFO`.)
3. Send an email to support@thermocalc.com. Make sure to include the following in the subject line:

License diagnostic information from <Name> where Name is replaced with your **name**, the **organisation name** and the **Site Number**. *You can find the five-digit site number on an invoice or any correspondence from Thermo-Calc Software.*

Designated Site 12345
 XYZ Company
 Dpt. of Material Science
 900 Main Street
 Stockholm 11190
 SWEDEN



4. A representative from Thermo-Calc Software replies to the email and attaches your license file(s).
5. Save the license file(s) to your computer or network.

Requesting the License File for Mac OS



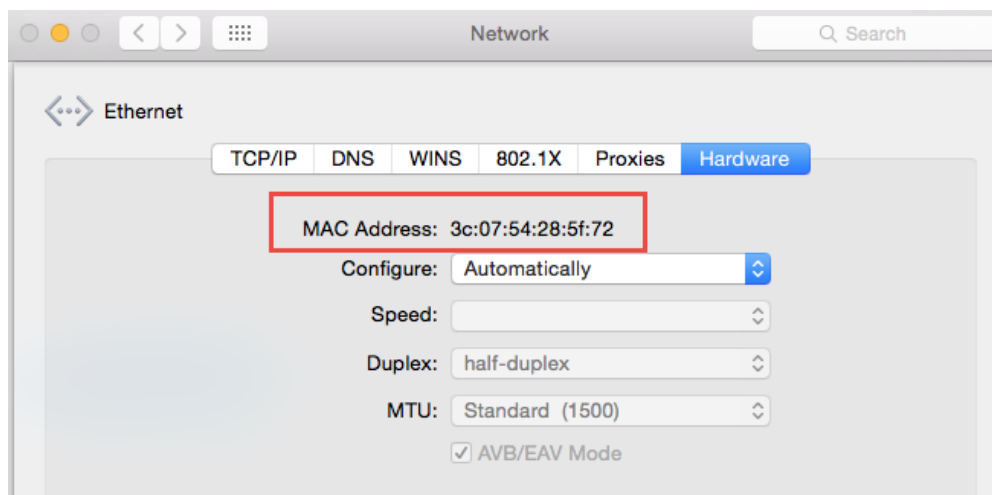
Demo (trial) installations: Skip this section. A license file is automatically installed with the software. You do not need to request it.



Upgrades to a new version of Thermo-Calc: Skip this section if you are upgrading to a new version of Thermo-Calc and (and you have a maintenance plan). Your license is sent to you in an email from Thermo-Calc Software AB. Save it to your computer to use during software installation.

1. From the Apple main menu, select **System Preferences**.
2. Click **Network**.
3. In the left column select **Ethernet** or **Built-in Ethernet** (do not select a WiFi connection as a local static MAC address is required).
4. Click **Advanced** → **Hardware**.

The **Network** window shows you the **MAC Address**. For example, the MAC address (the host ID) might be **3c:07:54:28:5f:72**.



5. Send an email to support@thermocalc.com and copy and paste the MAC address into the body of the email. Make sure to include the following in the subject line:


License diagnostic information from <Name> where Name is replaced with your **name**, the **organisation name** and the **Site Number**. *You can find the five-digit site number on an invoice or any correspondence from Thermo-Calc Software.*

Designated Site 12345
XYZ Company
Dpt. of Material Science
900 Main Street
Stockholm 11190
SWEDEN

To: support@thermocalc.com

Cc:

License diagnostic information from Jane Smith, XYZ Company, Site 12345

Add attachments  tclog.log (7.3 KB) 

6. A representative from Thermo-Calc Software replies to the email address provided and attaches your license file or files.
7. Save your license file to your computer or network.

Troubleshooting

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License Errors

Issue	Platform	Installation type	Action or link to more information
How do I add or update a standalone (SUNLL) license on a Windows computer where Thermo-Calc is already installed?	Windows	Standalone	Determining the Current License File Directory Path
How do I add or update a standalone (SUNLL) license on a Linux computer where Thermo-Calc is already installed?	Linux	Standalone	Determining the Current License File Directory Path
How do I add or update a network license on Windows?	Windows	Network	Determining the Current License File Directory Path
How do I add or update a network license on Linux?	Linux	Network	Determining the Current License File Directory Path
No license file found. Copy a valid license file to the installation directory after completing the installation.	All	All	You get this message if the wrong path or no license file is found at a path entered during the installation process. See Default Directory Installation Locations and Determining the Current License File Directory Path
MATLAB not found (for the TC-Toolbox for MATLAB component)	Windows	All	MATLAB® Installation Directory
Warning Environment variable “LSHOST” is not set. Software will not function properly.	All	Network	Specifying a New Server Name or IP Number
Problem running post-install step. Installation may not complete correctly.	Linux and Mac	Standalone	Mac OS Installations: Running the License Initialization Script or Linux Installations: Running the License Initialization Script

Issue	Platform	Installation type	Action or link to more information
Unable to run post-installation script, run the license initialization script as root after the installation.			
Firewall warnings related to license management software (License Manager and License Server)	Windows and Linux	Network	Firewalls
Client / Server naming mismatches	Windows and Linux	Network	Client/Server Mismatch
InstallScript engine missing	Windows	Network	You are not notified if the InstallScript scripting engine is not installed. Install the ISScript.msi file and then run the downloaded file from Thermo-Calc again as described in Set Up the License Manager on Windows

Determining the Current License File Directory Path

This topic explains how to find out where your license file is installed, either by default or if a different directory was chosen for previously installed versions. For new installations, where you may not have had a license file when you installed Thermo-Calc (for example, you had a demo version), you can also use these instructions to determine the correct file path.

From Thermo-Calc

If you have already installed Thermo-Calc, you can view the path to the license file in the GUI. Select **Help → Show License Info**.

In Console Mode you can run the SYS module command `DISPLAY_LICENSE_INFO`.

WINDOWS STANDALONE INSTALLATIONS

How do I add or update a standalone (SUNLL) license on a Windows computer where Thermo-Calc is already installed?

1. Unpack the .zip file that contains your standalone license and save the LSERVRC file on your computer. Find out where to place the new license file by opening a Command Prompt Window (cmd.exe) and type in the command line:

```
>set LSERVRC
```

2. Press `Enter`. The output from the command is the path to the license file (including the name of the license file). For example: if the output is

```
LSERVRC=C:\Users\<user>\Documents\Thermo-Calc\lservrc
```

then the new license file should be placed in `C:\Program Files\Thermo-Calc\2019b\`

LINUX STANDALONE INSTALLATIONS

How do I add or update a standalone (SUNLL) license on a Linux computer where Thermo-Calc is already installed?

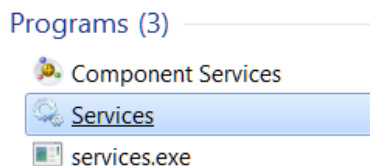
Find out where to place the new license file by opening a Terminal window and type in the command line:

```
echo $LSERVRC
```

WINDOWS NETWORK INSTALLATIONS

How do I add or update a network license on Windows?

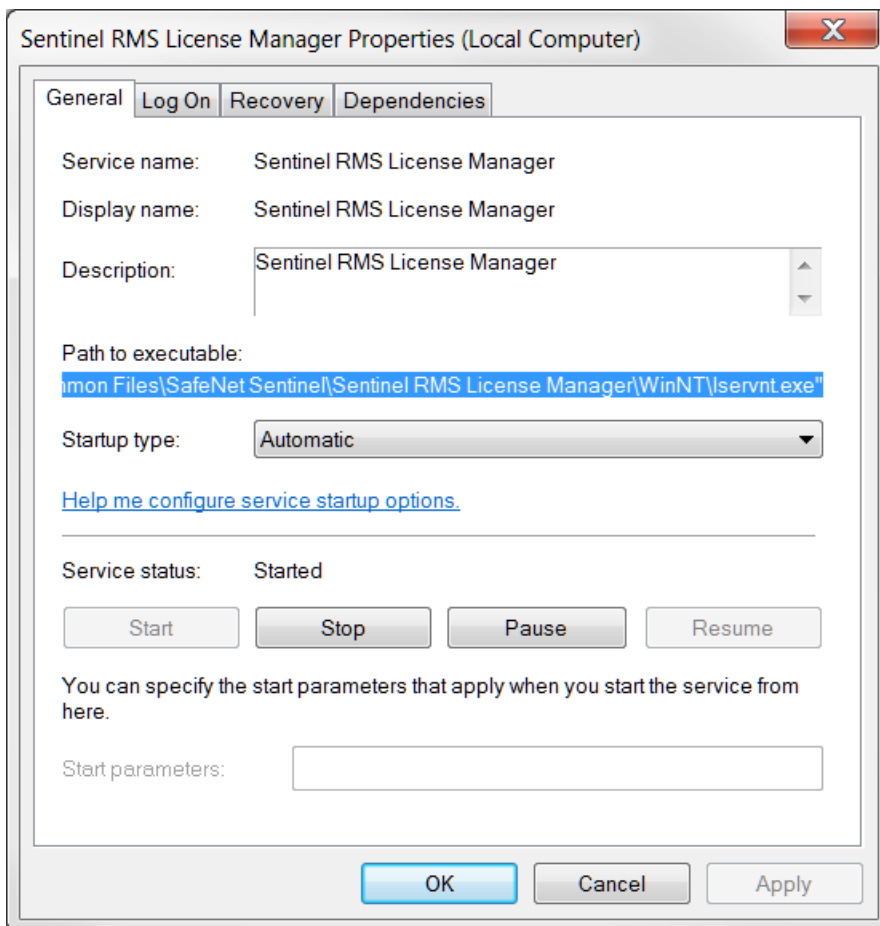
1. You need administrator rights to do the following.
 - On *Windows 7*, click the Start button and in the search field type Services. Double-click the Services result.



- On *Windows 8*, move the mouse over the right edge of the screen to access Search, click Settings and then enter and select View Local Services.
2. In the list of installed services, right-click **Sentinel RMS License Manager** and select

Properties from the pop-up menu.

3. On the **General** tab under **Path to executable**, click the line containing the path to see where the file **lservnt.exe** is located. The license file (lservrc) is in the same directory.



The default path for the license file is

```
C:\Program Files (x86)\Common Files\SafeNet Sentinel\Sentinel RMS
License Manager\WinNT\LSERVRC
```

4. Move your copy of the license file (lservrc) to this directory.
5. Restart the Sentinel RMS License Manager by:
 - Restarting the computer, or
 - Right-clicking **Sentinel RMS License Manager** and selecting **Restart** from the list of installed services.

LINUX NETWORK INSTALLATIONS

How do I add or update a network license on Linux?

Replace your current license file with the new license file. The license file is located in the same directory as the license server.

Specifying a New Server Name or IP Number

The Thermo-Calc Setup wizard does not warn you if the name or IP number entered to the server (with the license management software) is incorrect.

If the name or IP number is not set at all, or if it is set to an empty string, then when you start Thermo-Calc the following message displays: *Warning Environment variable "LSHOST" is not set. Software will not function properly.*

WINDOWS

This section explains how to specify or change the name or IP number of the server where the License Manager is installed and for a consolidated network client installation.

To install a license for an existing Thermo-Calc program, follow these steps:

1. Close all running Thermo-Calc programs.
2. Open a command line window.
 - In *Windows 8*, use Search (mouse-over the right edge of your screen) to find **cmd** and then double-click the Command line icon.
 - In *Windows 7*, from the Start menu click **Run** and type **cmd** in the field.
3. Specify the name or IP number of the licensing software server. Type:

```
set LSHOST=<name/IP number>
```

To display the current name or IP number, type:

```
set LSHOST
```

MAC

Permanently set the environmental variable LSHOST to specify a new licensing server name or IP number. Refer to the file `/Applications/Thermo-Calc-2019b.app/Contents/plist.info`.

In this file, you can manually set the TC19B_HOME variable, which specifies the home directory of the Thermo-Calc program. See the plist.info file for an example.

LINUX

You can set or change the name or IP number of the license server at a later time by setting the environmental variable “LSHOST” to this name or number.

MATLAB® Installation Directory

For Windows installations of the TC-Toolbox for MATLAB component, you may get an error message or window asking for the MATLAB installation directory path. If it is during the installation Setup process, enter the path in the field.

DETERMINING THE LICENSING SOFTWARE VERSION

Sometimes you may need to know the version of License Manager (Windows) or License Server (Linux) software being used. This can be useful while troubleshooting network installations.

- On *Windows* open a command prompt and go to the directory where `lservnt.exe` is found. For example:

```
>C:\Program Files (x86)\Common Files\SafeNet Sentinel\Sentinel RMS  
License Manager\WinNT
```

Type the command `>lservnt.exe -help` and the version is displayed.

- On *Linux* open a Terminal window and go to the directory where the `lserv` script is saved. For example:

```
>cd opt/Thermo-Calc/<version>/Licensing-files
```

Type the command `>./lserv -help` and the version is displayed.

Firewalls

WINDOWS

For a Windows License Manager installation you may have to change the system firewall settings to allow the License Manager to communicate with the computers running the client applications. Go to the Windows Firewall settings window to see if there are any problems. If prompted, select Unblock the system firewall for the Sentinel RMS License Manager and click Next.

LINUX

For a Linux License Server installation you need to open the UDP port 5093 in your firewall. In case you have installed SELinux you might also need to disable it by setting SELINUX=permissive in the `/etc/selinux/config` file.

Client/Server Mismatch

For some network installations there can be a naming mismatch that causes errors. The server (where the license management software is installed) gets information from its DNS servers that an IP address (aaa.bbb.ccc) belongs to a computer (Computer A). But the client computer identifies itself as having a different IP address (aaa.bbb.ccc.eee) for the same computer (Computer A).

Even if the IP address of the client computer belongs to a subnet range listed in the license file, there is a problem with accessing the license file because the computer name does not match the information.

You may need your organisation's network administrator to assist with this issue.

HOW TO CHECK

Compare computer names on the client computer and server

1. On the client computer, start a command prompt **cmd.exe** and type `ipconfig /all`. Press `Enter`. A variety of data is displayed on screen. Write down the following information for later comparison:
 - Host name
 - Dns Suffix
 - Current IPv4 Address
2. In the command window, type `nslookup <client_computer_name>`, where *client_computer_name* is the actual name of the client. Press `Enter`.

This shows what information is saved on the DNS Servers used by the client computer. This information should match what is shown in the output from the first step.

3. On the server that holds the license management software, open a command prompt and run the command line: `nslookup client_computer_name`. The output lists the information for this server.

Does it match the information given by the command `ipconfig /all` on the client computer? If not try the following:

Try these options to correct the issue

1. If the client computer has a dynamic (DHCP) IP address, either change it to a static one or make a reservation on the DHCP Server so that the computer always get the same IP address.
2. Update the records on the DNS Servers used by both the client computer and the server computer.

You can also hard code computer names and IP addresses in the local "address book" of the client and server:

1. On the client computer, make a backup copy of the file `C:\Windows\System32\drivers\etc\hosts`.
2. Open the original in a simple text editor.
3. Add a new line which contains the IP and name of the server, for example:
`192.168.29.27 license_server.thermocalc.se.`
4. Save the changes.
5. On the server, make a backup copy of the file `/etc/hosts`.
6. Open the original in a simple text editor.
7. Add a new line which contains the IP and name of the client, for example: `192.168.29.47 Computer_A.thermocalc.se.`
8. Save the changes.
9. In the host file, there is an example of how the operating system (Windows or Linux) wants the line in the hosts file to look like.

Mac OS Installations: Running the License Initialization Script

As part of the Standalone installation of Thermo-Calc, the Setup runs a license initialization script. If this part of the installation process did not complete properly for a standalone installation, you must manually run the license initialization script. You need the administrator username and password for these steps.

HOW TO RUN THE SCRIPT

For this script to successfully initialize the license, the license file must be called **lservrc** and be

located in the folder:

```
/Users/Shared/Thermo-Calc
```

► Default Directory Installation Locations

1. Open a terminal window. The **Terminal** application is in the */Applications/Utilities* folder.
2. At the prompt, enter this command:

```
$ sudo /Applications/Thermo-Calc-  
2019b.app/Contents/Resources/license-initialization-MacOS-x86_64.sh
```

For demo installations, the path should be `/Applications/Thermo-Calc-2019b-Demo.app/Contents/Resources/ license-initialization-MacOS-x86_64.sh`.

If you are not already logged in as an administrator, you probably cannot run the `sudo` command. If this is the case, then you can use the `su` command in the terminal window to login as an administrator. Contact your local system administrator for help.

3. Enter the administrator password and press `Enter`.
4. When you restart your computer and run the license initialization script, you are ready to start using Thermo-Calc.



If you did not install a license file during this procedure, you can still start Thermo-Calc although you will get the **No license file found** message.

Linux Installations: Running the License Initialization Script

As part of a Standalone installation of Thermo-Calc, the Setup runs a license initialization script. If you get a warning message during the standalone installation Unable to run post-installation script, run the license initialization script as root after the installation, then you need to manually run the script as root.

OPENSUSE ADMINISTRATION (SUDO) USERS

Note the following if you are a sudo user (administrator) in openSUSE installing Thermo-Calc using this command:

```
sudo ./linux-installation-x64-6.0.0.17347.run
```

When this command is used, you will do a text-based installation instead of having a graphical interface to guide you. The information is the same, just without the user interface.

HOW TO RUN THE SCRIPT



For this script to successfully initialize the license, the license file must be called **lservrc** and be located in the directory where you have installed Thermo-Calc.



Default Directory Installation Locations

1. In the console, go to the Thermo-Calc installation directory.
 - The license file is put in `/home/<user>/Thermo-Calc` if you are installing as a non-root user, where `<user>` is your user name.
 - If you are installing as root, then this directory is `opt/Thermo-Calc/`.
3. Enter this command:

```
$ sudo sh license-initialization-linux.sh
```

If you are not able to execute the `sudo` command because you are not on the sudoers list, you must log in as a root user with the command `su`, and then use `sh` to run the license initialization script. For example, on a 64-bit computer, enter the following:

```
$ sh license-initialization-linux.sh
```

4. Log out of Thermo-Calc and then log back in to save these changes.

Uninstalling Thermo-Calc

In this section:

Uninstalling Thermo-Calc	62
Uninstalling Standalone Versions of TC-PRISMA	63

Uninstalling Thermo-Calc

WINDOWS 10

1. From the **Control Panel** Desktop app, go to **Programs → Programs and Features → Uninstall or change a program**.
2. In the list of programs, locate the version of Thermo-Calc you want to uninstall. Click to highlight that row.
3. Click **Uninstall/Change**.
4. In the **Setup** window, **Uninstallation Mode** dialog box, choose to uninstall the **Entire application** or **Individual components**. Follow the instructions to finish.

WINDOWS 7

1. From the **Start** menu, go to **All Programs** or **All Apps → Thermo-Calc**.
2. Click **Uninstall-Thermo-Calc<version>**.
3. In the **Uninstallation Mode** window, choose to uninstall the **Entire application** or **Individual components**. Follow the instructions to finish.

MAC

Deleting the program from the Applications folder does not remove the program from your operating system. Run the **Thermo-Calc-<version>-uninstaller** program located in the Applications folder. This is also applicable to the Demo version of the software.

1. Go to the **Applications** folder and double click the file that starts with **Thermo-Calc-<version>-uninstaller**. Enter the administrator's user name and password.
2. Click **Yes** to choose **Entire application** or select individual components. Otherwise click **No** to quit.
3. The **Uninstalling Thermo-Calc** window shows the progress. Click **OK** when prompted.

LINUX

1. To start the uninstallation procedure, in the Thermo-Calc installation directory use the command


```
./Thermo-Calc-2019b-uninstaller.run
```

For *Thin Client* installations, use the command

```
./Thermo-Calc-client-2019b-uninstaller.run
```

2. To remove the whole application, including all its components, select **Entire application** and click **Forward**, or to remove specific components, select **Individual components** and click **Forward**.



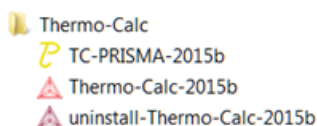
If you intend to reinstall Thermo-Calc 2019b it is important to remove the environmental variable TC19B_HOME by logging out and back into the Linux user account.

Uninstalling Standalone Versions of TC-PRISMA

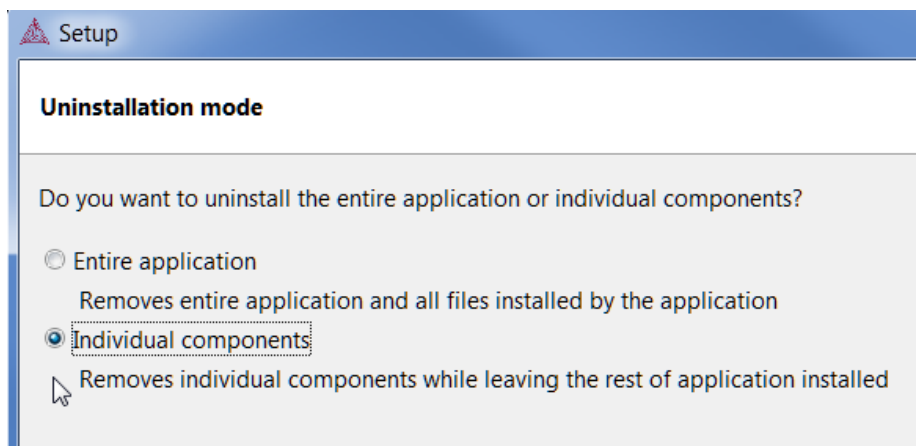


As of Thermo-Calc version 2016a, TC-PRISMA is no longer a standalone program. It is integrated into the Thermo-Calc Graphical Mode and considered an add-on module called the Precipitation Module. It is also available for all platforms (Windows, Mac and Linux). If you have older versions of the TC-PRISMA software that you want to uninstall, follow these instructions.

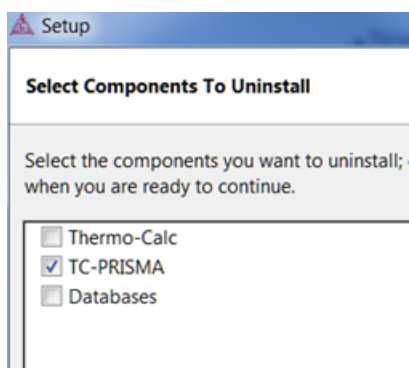
1. Go to the Thermo-Calc uninstaller. For example, in Windows 7, go to **Start → All Programs → Thermo-Calc** or in Windows 10 go to **Start → All Apps → Thermo-Calc**.
2. Click **uninstall-Thermo-Calc-2015b** (or the version of TC-PRISMA you have).



3. In the **Setup** window, click **Individual components**. Click **Next**.



4. Select the **TC-PRISMA** check box.



5. Click **Next** and then **OK** when the software component is uninstalled.

Quick Installation Guides

In this section:

Windows® Standalone Quick Install Guide	66
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TC-Python Quick Install Guide	74

Windows® Standalone Quick Install Guide

This quick guide helps you do a typical, custom or demo standalone installation. A *standalone* installation is used with the Single-User Node-Locked License (SUNLL), where the software and the license file are together on one computer.

This guide is applicable to:

- Windows operating systems
- Standalone installation (SUNLL) – typical and custom types
- Demo installations – during the installation you only need to do steps 2 and 3.
- Upgrading to a new standalone version of Thermo-Calc (maintenance plan only)



Also see the *Thermo-Calc Installation Guide* for detailed instructions for other operating systems and network installations.

Request a License File

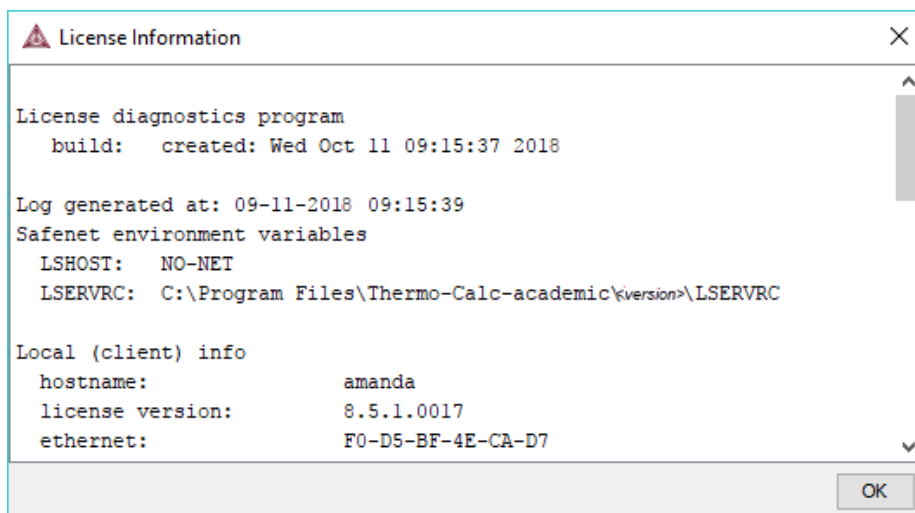


Demo (trial) installations: Skip this section. A license file is automatically installed with the software. You do not need to request it.



Upgrades to a new version of Thermo-Calc: Skip this section if you are upgrading to a new version of Thermo-Calc and (and you have a maintenance plan). Your license is sent to you in an email from Thermo-Calc Software AB. Save it to your computer to use during software installation.

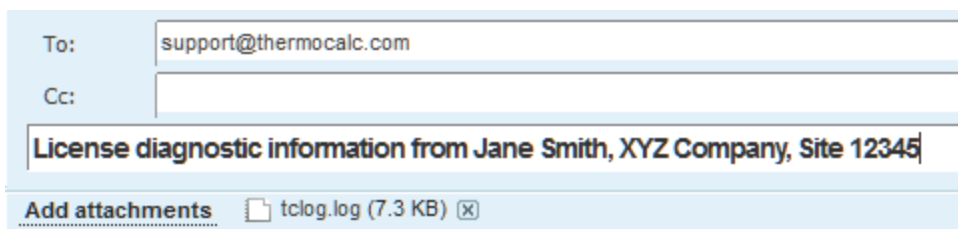
1. To access the computer information you need to provide to get a license, start Thermo-Calc and select **Help → Show License Info**.



2. Copy the information from the **License Information** window. A lot of information may be shown below the initial screen, so make sure you scroll down to the end when you select and copy the window's contents. (Alternatively, you can copy the same information from the console by using the SYS module command `DISPLAY_LICENSE_INFO`.)
3. Send an email to support@thermocalc.com. Make sure to include the following in the subject line:

License diagnostic information from <Name> where Name is replaced with your **name**, the **organisation name** and the **Site Number**. *You can find the five-digit site number on an invoice or any correspondence from Thermo-Calc Software.*

Designated Site 12345
 XYZ Company
 Dpt. of Material Science
 900 Main Street
 Stockholm 11190
 SWEDEN



4. A representative from Thermo-Calc Software replies to the email and attaches your license file(s).
5. Save the license file(s) to your computer or network.

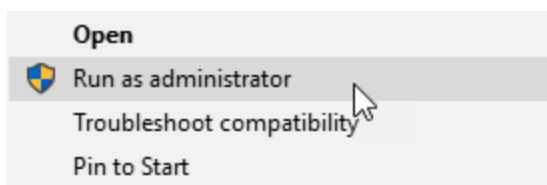
Install the Software

Download and run your Thermo-Calc installation software



Administrative rights are required to complete this installation.

1. For web links sent in an email from Thermo-Calc Software, go to the URL and log in with the information provided. Then navigate to the Windows folder and click the link to download the software.
2. Go to the folder where you downloaded the software. Right-click the **.exe** file and choose **Run as administrator** to launch the **Setup** program.

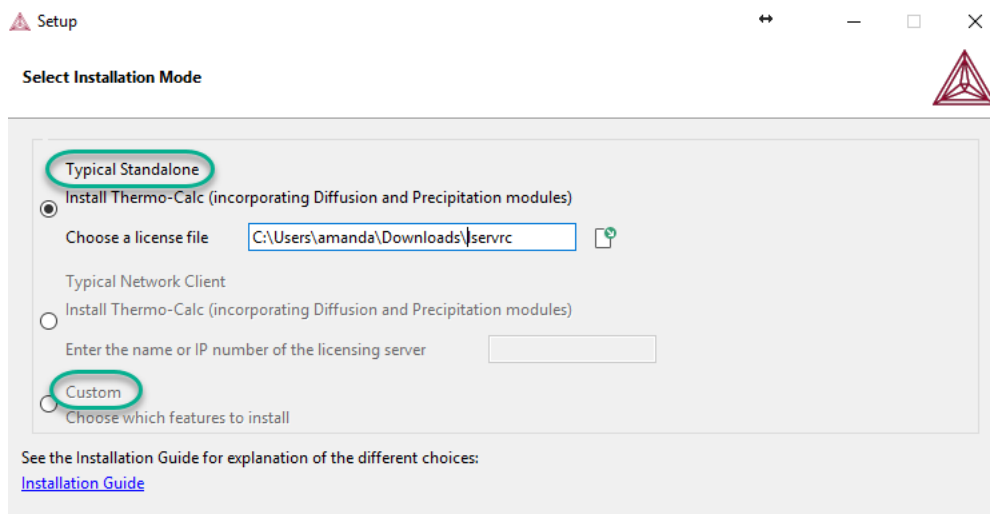


3. On the **Setup-Thermo-Calc** window click **Next**.
4. On the **License Agreement window** click to accept the license agreement. Click **Next**.



Demo (trial) installations: Your installation starts and is done when the **Completing the Thermo-Calc Demo Setup Wizard** opens. Click **Finish** and start using Thermo-Calc.


Select the installation mode – typical or custom



1. In the **Select installation mode** window click **Typical Standalone** or **Custom** to choose specific features to install.



The **Custom** option appears greyed out, but it is available to select.

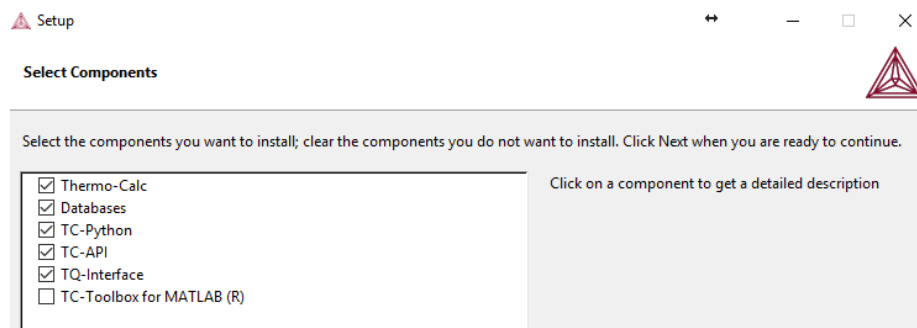
2. For a **Typical Standalone** installation, in the **Choose a license file** field click the file button  to navigate to where you saved the license file emailed to you from Thermo-Calc Software. The license file is called **lservrc**. Click **Next**.




DEMO Typical Standalone installations: Your installation starts and is done when the **Completing the Thermo-Calc Demo Setup Wizard** opens. Click **Finish** and start using Thermo-Calc.

Customize your installation

1. In the **Select Components** window, click to select what you want to install. Click **Next**.

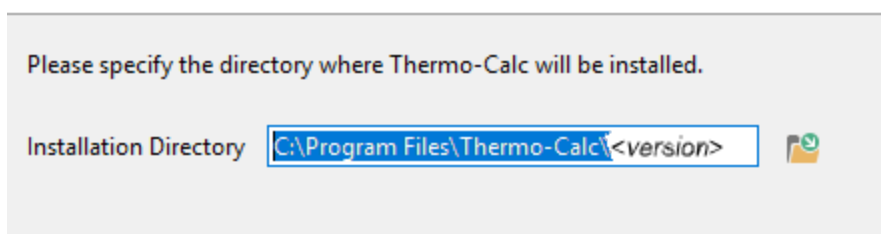



2. In the **Installation Directory** window, either accept the default, enter a file path or click the file button  to navigate to another directory.

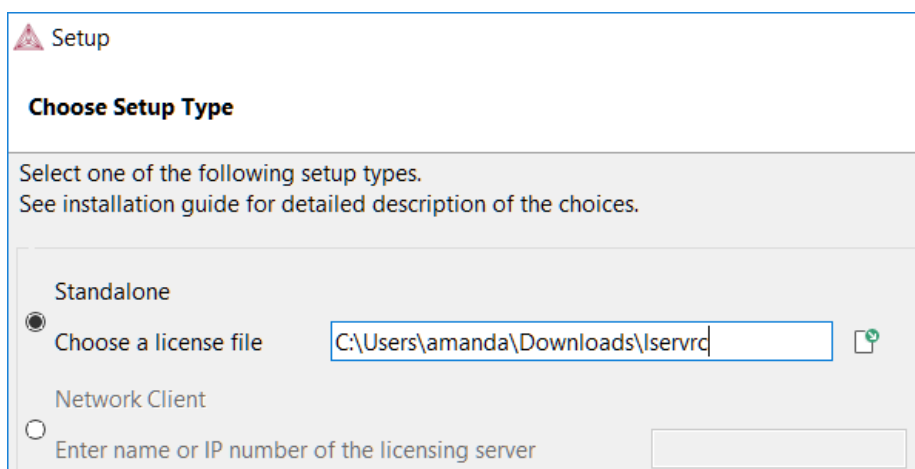


Setup

Installation Directory



3. In the **Choose Setup Type** window it defaults to **Standalone**. In the **Choose a license file** field you can accept the default file path or click the file button  to navigate to, where you saved the license file emailed to you from Thermo-Calc Software (called **lservrc**). Click **Next**.



4. In the **Specify Configuration** window the **Create Shortcuts on Desktop** check box is selected. Click **Next**.
5. In the **Ready to Install** window click **Next**. Click **Finish** and start using Thermo-Calc.

Mac OS® Standalone Quick Install Guide

This quick guide helps you do a typical or demo standalone installation. A *standalone* installation is used with the Single-User Node-Locked License (SUNLL), where the software and the license file are together on one computer.

This guide is applicable to:

- Mac operating systems
- A typical Standalone installation (SUNLL)
- Demo installations – during the installation process you only need to do steps 1 and 2.
- Upgrading to a new standalone version of Thermo-Calc (maintenance plan only)



Also see the *Thermo-Calc Installation Guide* for detailed instructions for other operating systems and network installations.

Request a License File



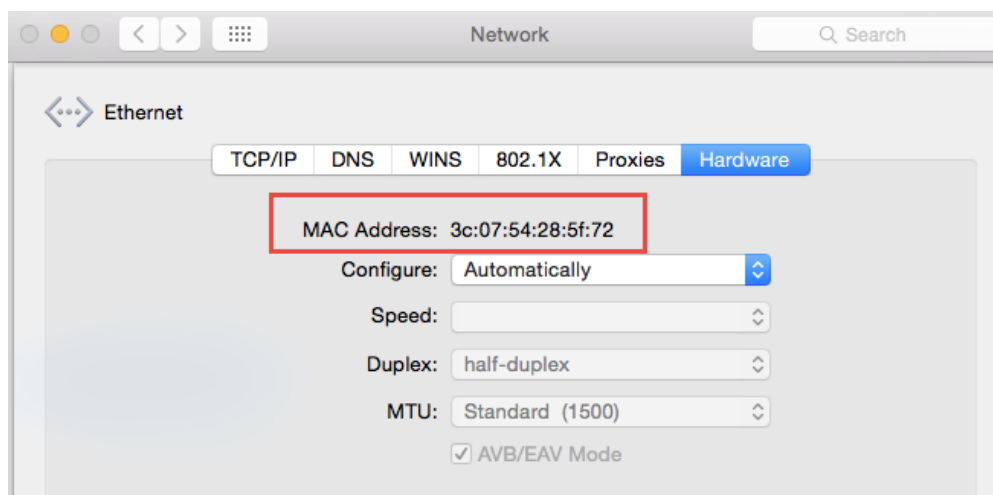
Demo (trial) installations: Skip this section. A license file is automatically installed with the software. You do not need to request it.



Upgrades to a new version of Thermo-Calc: Skip this section if you are upgrading to a new version of Thermo-Calc and (and you have a maintenance plan). Your license is sent to you in an email from Thermo-Calc Software AB. Save it to your computer to use during software installation.

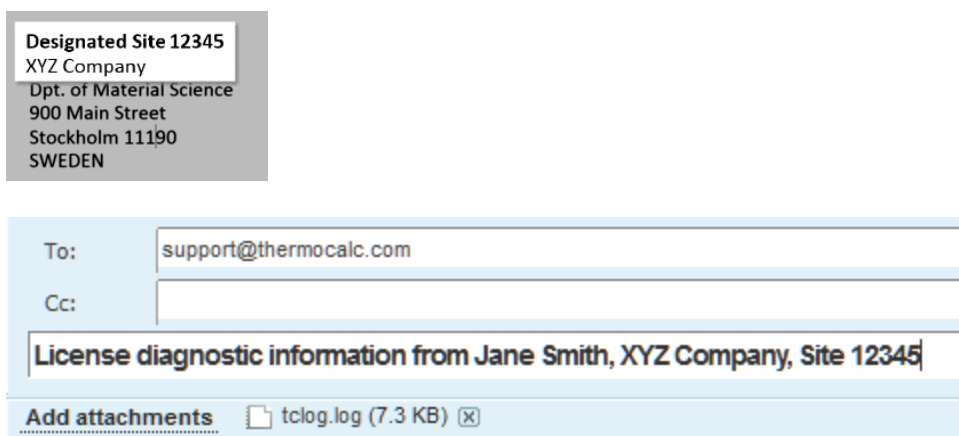
1. From the Apple main menu, select **System Preferences**.
2. Click **Network**.
3. In the left column select **Ethernet** or **Built-in Ethernet** (do not select a WiFi connection as a local static MAC address is required).
4. Click **Advanced** → **Hardware**.

The **Network** window shows you the **MAC Address**. For example, the MAC address (the host ID) might be **3c:07:54:28:5f:72**.



5. Send an email to support@thermocalc.com and copy and paste the MAC address into the body of the email. Make sure to include the following in the subject line:

License diagnostic information from <Name> where Name is replaced with your **name**, the **organisation name** and the **Site Number**. *You can find the five-digit site number on an invoice or any correspondence from Thermo-Calc Software.*



6. A representative from Thermo-Calc Software replies to the email address provided and attaches your license file or files.
7. Save your license file to your computer or network.

Install the Software

Download and install XQuartz

The XQuartz open-source X Windows system is required to run Thermo-Calc on Mac OS X.

1. In a web browser go to <https://www.macupdate.com> or to download it directly from XQuartz, <http://xquartz.macosforge.org/landing/>.
2. In the **Search Mac Apps** field, enter *XQuartz*.
3. Click the **XQuartz** search result. For example, based on the recent version, the name is XQuartz-2.7.7.dmg.
4. Click **Download**.
5. Double-click the **XQuartz.pkg** file. Follow the instructions.
6. Click **OK** when the message about logging out displays and click **Close** when the installation is successful.

Download and run your Thermo-Calc installation software



Administrative rights are required to complete this installation.

1. For web links sent in an email from Thermo-Calc Software, go to the URL and log in with the information provided. Then navigate to the Mac folder and click the link to

download the software.

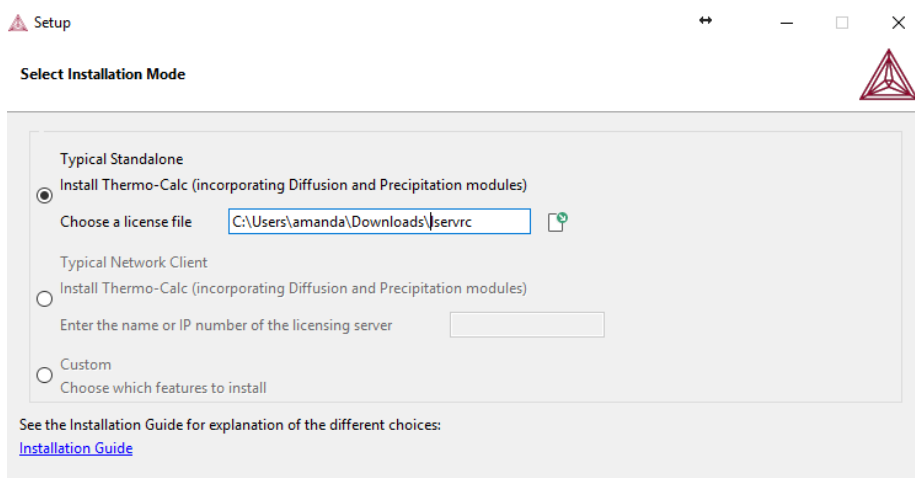
2. Double-click the downloaded file to launch the installation.
3. On the **Setup-Thermo-Calc** window click **Next**.
4. On the **License Agreement window** click to accept the license agreement. Click **Next**.




Demo (trial) installations: Your installation starts and is done when the **Completing the Thermo-Calc Demo Setup Wizard** opens. Click **Finish** and reboot your computer to start using Thermo-Calc.

Select the installation mode

1. In the **Select installation mode** window click **Typical Standalone**.



2. In the **Choose a license file** field click the file button  to navigate to where you saved the license file emailed to you from Thermo-Calc Software. The license file is called **lservrc**. Click **Next**.

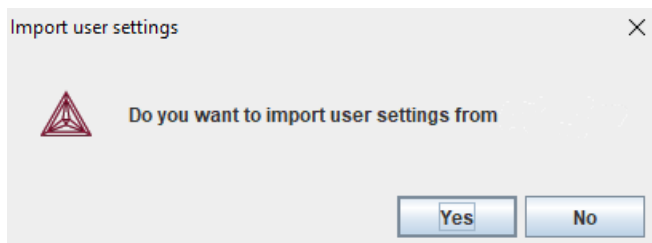


To prevent errors, leave this field blank if you did not get a license file yet.

3. The installation starts and is done when the **Completing the Thermo-Calc Setup Wizard** window opens.
4. Click **Finish** and start using Thermo-Calc.



Mac OS installations and if you have previous Thermo-Calc installations: When you launch Thermo-Calc with the new or updated version, the splash screen hides the **Import User Settings** dialog box. In order to proceed you need to click the splash screen and then click **Yes** or **No** in the dialog box.



TC-Python Quick Install Guide

This quick guide helps you do a TC-Python API installation.



There is an HTML help file you can open in your browser, plus a PDF of the same content, and several examples available with your Thermo-Calc installation. The TC-Python API Reference Guide is also [available on the web](#).

Once you have installed TC-Python, go to Thermo-Calc and from the menu select **Help → Manuals Folder** and go to:

- **TC-Python**, then double-click index.html (or any .html file).
- **Software Development Kits (SDKs)** for the PDF.



Go to Thermo-Calc and search the online help (**Help>Online Help**).



For an installation video plus more information, go to <https://www.thermocalc.com/products-services/software/tc-python/>

This quick guide helps you to get a working TC-Python API installation.



A license is required to run TC-Python.

Install a Python Distribution



If you already have a Python distribution installation, version 3.5 or higher, skip this step.

These instructions are based on using the Anaconda platform for the Python distribution. Install version 3.5 or higher to be able to work with TC-Python, although it is recommended that you use the most recent version.

Install Anaconda

1. Navigate to the Anaconda website: <https://www.anaconda.com/download/>.
2. Click to choose your OS (operating system) and then click **Download**. Follow the instructions. It is recommended you keep all the defaults.

Install Thermo-Calc and the TC-Python SDK



TC-Python is available starting with Thermo-Calc version 2018a.

1. Install Thermo-Calc and choose a **Custom** installation.

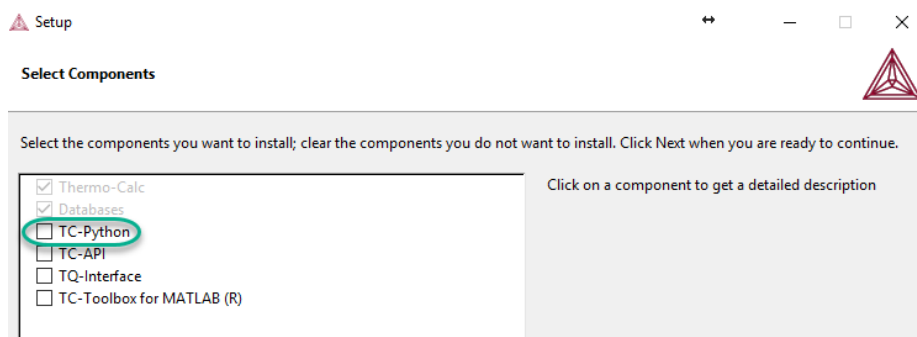


See "Custom Standalone Installation" in the *Thermo-Calc Installation Guide*.



If you have already installed Thermo-Calc, you need to find the installation file (e.g. Windows *.exe, Mac *.zip and Linux *.run) to relaunch the installer and then continue with the next steps.

2. On the **Select Components** window, click to select the **TC-Python** check box.



3. On the **Install TC-Python** window, click **Next**.
4. When the installation is complete, the TC-Python folder opens and includes the *.whl file needed for the next step. There is also an **Examples** folder with Python files you can use in the IDE to understand and work with TC-Python.



The installation location for this API is the same as for other SDKs and based on the OS. For details, see "Default Directory Locations" in the *Thermo-Calc Installation Guide*.

Install TC-Python



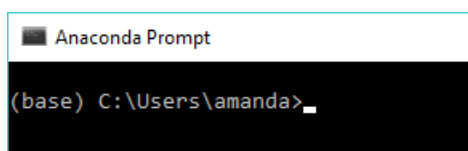
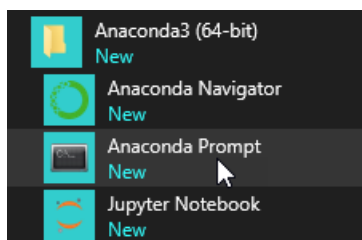
Updating to a Newer Version

On Windows, it is recommended you use the Anaconda distribution prompt (i.e. Anaconda), especially if you have other Python installations.



Do not use Virtual Environments unless you have a good reason to do so. Also see [Fixing Potential Issues with the Environment](#).

1. Open the command line. For example, in Anaconda on a Windows OS, go to **Start → Anaconda → Anaconda Prompt**.



2. At the command line, enter the following. Make sure there are no spaces at the end of the string or in the folder name or it will not run:

```
pip install <path to the TC-Python folder>/TC_Python-<version>-py3-none-any.whl
```



For example, on a Windows OS Standalone custom installation the path to the TC-Python folder is `C:\Users\Public\Documents\Thermo-Calc\2019b\SDK\TC-Python\`



Details for Mac and Linux installations are described in "Default Directory Locations" in the *Thermo-Calc Installation Guide*. On Linux typically `pip3` is used.

3. Press <Enter>. When the process is completed, there is a confirmation that TC-Python is installed.

Install an IDE (Integrated Development Environment)

Any editor can be used to write the Python code, but an IDE is recommended, e.g. PyCharm. These instructions are based on the use of PyCharm.

Use of an IDE will give you access to code completion, which is of great help when you use the API as it will give you the available methods on the objects you are working with.

1. Navigate to the PyCharm website: <https://www.jetbrains.com/pycharm/download>.
2. Click to choose your OS and then click **Download**. You can use the **Community** version of Pycharm.
3. Follow the instructions. It is recommended you keep all the defaults.



For Mac installations, you also need to set some environment variables as described below in [Mac OS: Setting Environment Variables](#) .

Open the IDE and Run a TC-Python Example

After you complete all the software installations and set up the pip install path, you are ready to open the IDE to start working with TC-Python.

It is recommended that you open one or more of the included examples to both check that the installation has worked and to start familiarizing yourself with the code.

Open the TC-Python Project in PyCharm



When you first open the TC-Python project and examples, it can take a few moments for the Pycharm IDE to index before some of the options are available.

1. Open PyCharm and then choose **File → Open**. The first time you open the project you will need to navigate to the path of the TC-Python installation as done in Step 4.



For example, on a Windows OS Standalone custom installation the path to the TC-Python folder is `C:\Users\Public\Documents\Thermo-Calc\2019b\SDK\TC-Python\`



Details for Mac and Linux installations are described in "Default Directory Locations" in the *Thermo-Calc Installation Guide*.

2. Click the **Examples** folder and then click **OK**.
3. From any subfolder:
 - Double-click to open an example file to examine the code.
 - Right-click an example and choose **Run**.

Fixing Potential Issues with the Environment

In most cases you should run TC-Python within your **global** Python 3 interpreter and not use Virtual Environments unless you have a good reason to do so. If there are problems with the interpreter settings, you can resolve them in the Settings window:

1. Go the menu **File → Settings**.
2. Navigate in the tree to `<Project.YourProjectName>` and choose **Project Interpreter**.
3. Click on the settings symbol close to the **Project Interpreter** drop-down menu and choose **Add**.
4. Now choose **System Interpreter** and add your existing Python 3 interpreter.
5. Select your added interpreter and confirm.



If you are not following the recommended approach and create a new project (**File → New Project**), you need to consider that by default the options to choose the interpreter are hidden within the **Create Project** window. Therefore, click **Project Interpreter: New Virtual Environment** and in most cases choose your *System Interpreter* instead of the default *New Virtual Environment*.



If you really need to use a Virtual Environment, it is recommended you review the hints provided in the **Best Practices** section in the full TC-Python HTML help or PDF.

Updating to a Newer Version

When updating to a newer version of Thermo-Calc, **you always need to also install the latest version of TC-Python**. It is not sufficient to run the installer of Thermo-Calc. The procedure is generally identical to [Step 3](#):

```
pip install <path to the TC-Python folder>/TC_Python-<version>-py3-
none-any.whl
```

In case of problems you may wish to uninstall the previous version of TC-Python in advance:

```
pip uninstall TC-Python

pip install <path to the TC-Python folder>/TC_Python-<version>-py3-
none-any.whl
```

However, that should normally not be required. Note that on Linux usually *pip3* is used.

You can check the currently installed version of TC-Python by running:

```
pip show TC-Python
```

Mac OS: Setting Environment Variables

In order to use TC-Python on Mac you need to set some environment variables.

```
TC19B_HOME=/Applications/Thermo-Calc-2019b.app/Contents/Resources
```

If you use a license server:

```
LSHOST=<name-of-the-license-server>
```

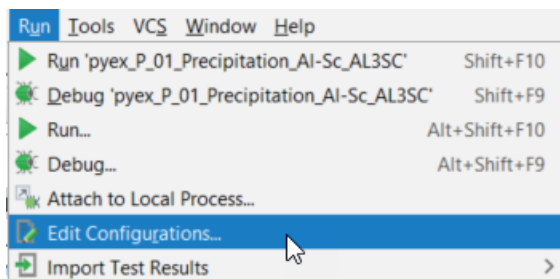
If you have a node-locked license:

```
LSHOST= NO-NET

LSERVRC=/Users/Shared/Thermo-Calc/lserverc
```

In PyCharm, you can add environment variables in the configurations.

Select **Run → Edit Configurations** to open the **Run/Debug Configurations** window. Enter the environment variable(s) by clicking the button to the right of the **Environment Variables** text field. Now the environment variable(s) will be set for each new configuration by default. The same way for configuring the environment variables can be used on other operating systems as if necessary.



Diagnostic Script

A new diagnostic script is available as a Miscellaneous example (diagnostics.py) as well as in the Troubleshooting section of the TC-Python guide. Information about the script is also available on our [website](#). The script automatically prints useful suggestions that, in many cases, will help you to fix the problem yourself. If you are unable to solve the problem, contact us for support.

It is important to run the diagnostic script EXACTLY the same way as you run your TC-Python script (in the same IDE, same project, same Python environment, same Jupyter notebook, etc).

The script automatically prints useful suggestions that, in many cases, will help you to fix the problem yourself. If you are unable to solve the problem, contact us for support.