PMOD Mac OSX Installation

INSTALLATION MANUAL
Version 4.1

π.pmod

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1   PMOD Installation on Mac OS X

The installation for all types of PMOD systems starts with the software extraction from the installation flash memory stick. For PMOD network clients this is all that has to be done. Only for PMOD standalone systems and PMOD license server systems, the USB protection key drivers must additionally be installed and the license file copied to the *system/lcs* folder.

Installation Account

It is strongly recommended to install PMOD when logged into the account of the user who will later use PMOD. Note that during WIBU driver installation, administrator privileges will be required.

If multiple users need to run PMOD locally, a root installation might still be considered. In this case, the permissions of the PMOD directory and all data directories will have to be opened, and the execution permission granted for the scripts which start PMOD and its servers. Additional permission problems might occur which are sometimes tricky to solve.

1.1   Installation Overview

PMOD supports two licensing schemes: stand-alone and network licenses.

Licensing, Stand-alone License

The PMOD software stand-alone licensing mechanism consists of two components:

1. a **USB protection key** (WIBU-Box/RU, WIBU-SYSTEMS AG, *http://www.wibu.com*), and

2. a license file **pstarter.lcs** (in sub-directory *system/lcs* of the PMOD installation).

During PMOD startup the license information encoded in the USB key is read and compared to that in the license file. Only if the two informations match, startup proceeds. Next is a check whether the PMOD version purchased allows running the currently installed version. If all checks are successful, the PMOD ToolBox appears showing the purchased modules, and processing can start. Note that the USB key must remain connected while running PMOD.

Licensing, Network License

The PMOD network licensing scheme consists of a PMOD license server which manages a pool of purchased licenses, and an arbitrary number of PMOD clients which can check out unused licenses from the server. As soon as the PMOD program on a client is closed, the license is returned to the managed server pool. If the PMOD client crashes for some reason, the license is re-collected to the pool after about 15 minutes. On the other hand, if the license server is stopped, the clients show a warning message to the user and allow to continue work for a few minutes. Then, the clients will be stopped, unless the server has been started again.

On the license server PMOD is installed in the same way as for a stand-alone license with the USB key, but the license file turns it into a license server.

On the clients PMOD is also installed in the standard way, *except* that

-   installation of the drivers for the USB protection key is not required;

-   no license file is required.

Note the following:

-   The license server PMOD installation is only intended for server purposes and not for data processing.

-   The license server must be running and the USB key must be connected at all times.

-   The license server and the clients must run the same PMOD version.

-   It is not required that the license server and the clients have the same operating system.

Java Runtime Environment (JRE)

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The entire PMOD software has been programmed in Java and therefore requires an appropriate Java Runtime Environment (JRE) to be executed. As a PMOD installation pre-requisite Pmod needs Java 11 to be installed on the system. Java 11 can be downloaded and installed from here. During PMOD installation, an appropriately configured JRE is extracted into the java sub-directory of the PMOD installation. This dedicated JRE will then be used for running PMOD. By this controlled environment, PMOD will remain unaffected from changes due to automatic upgrade procedures.

Installation Steps

The installation of the PMOD software consists of the following steps which should be performed in the proposed sequence. They are explained in detail in the following installation sections.

1. Extraction of the PMOD program files, the JRE, and optionally the example data to the *Pmod4.1* directory in a user-defined directory.
    This installation step is required for: **Stand-alone Installation, License Server, Network Clients.**

2. Installation of the USB protection key drivers for reading the information from the WIBU-Box/RU plugged into the USB port. *Please do not connect the PMOD USB protection key before this installation has been completed.*
    This installation step is required for: **Stand-alone Installation, License Server.**

3. Installation of the PMOD license file *pstarter.lcs*. The license file can be downloaded from the **Support** area of the PMOD website after the personalized login (please refer to the delivery note of your PMOD package for login information).
    This installation step is required for: **Stand-alone Installation**, **License Server**.

1.2   PMOD Software Extraction

The following software extraction procedure must be performed for standalone PMOD installations, for PMOD servers, and also for all PMOD network clients.

Please begin by inserting the PMOD installation flash memory stick. Then start the installer by starting the **RunSetup.command** in the *Setup/MacOSX* directory on the memory stick by double-clicking. The following installation screen appears.

> If double-clicking does not start the installer (using Catalina OSX) please enter the following command in a terminal window
> ```
> sh PATH_TO_PMOD_INSTALL_FOLDER/pmod-41-setup-
> macosx/Setup/RunSetup.command
> ```
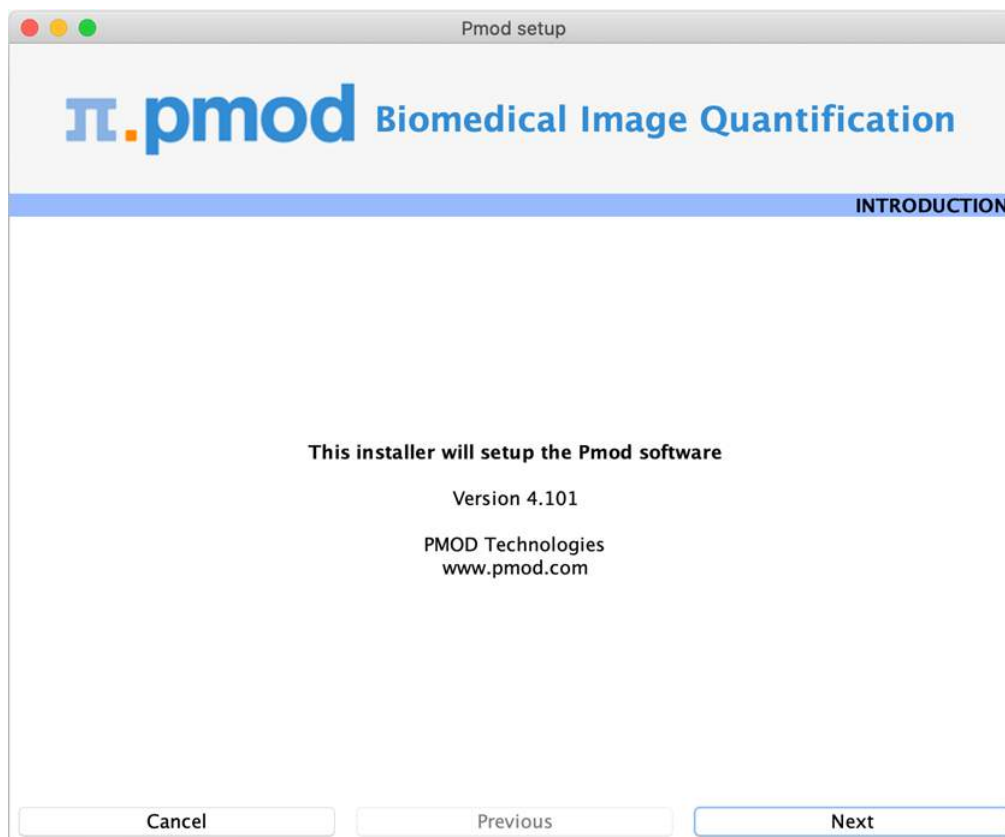
Please use **Next** to proceed and accept the license agreement in the appearing dialog window. After activating **Next** the window for configuring the installation appears.
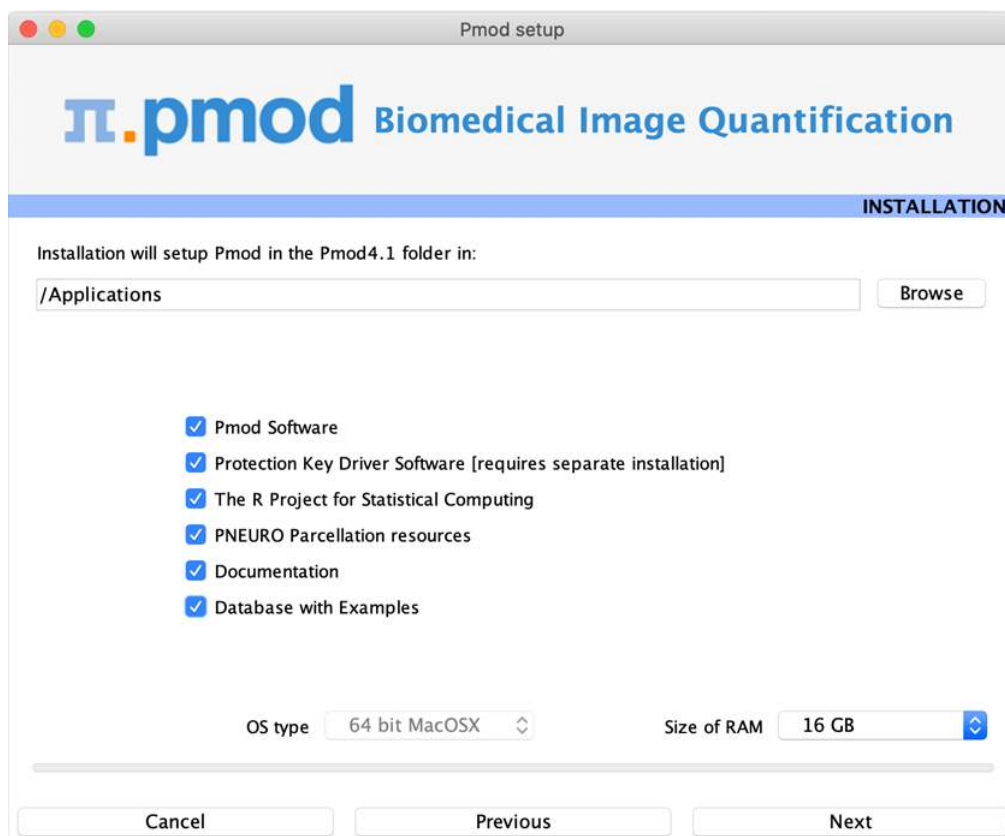
Please perform the following configurations:

Installation Path

Use the **Browse** button to select the parent directory for the installation. There, the installer will create a new directory **Pmod4.1** for the program files and the data. Please make sure that 4.3GB of free space is available for the full package.

Packages

It is highly recommended to install the four packages, the **Pmod Software**, the **Protection Key Driver Software**, the **Documentation**, and the **Database with Examples**. The **Database with Examples** requires about 970MB and will show up as database called **Pmod**. This database will allow getting acquainted with the programs because it contains examples for the different types of data analysis. Note, however, that it is recommended establishing an new database externally to PMOD for productive data processing. The **PNEURO Parcellation resources**, should only be enabled, if the PNEURO tool has been licensed, as the required space is 350MB.

### Properties of Operating System and RAM

The operating system of your target computer needs to be 64-Bit. **Size of RAM** can be set to any size. However, if the specified size exceeds the physical RAM, the system will start swapping after RAM space is exhausted and will become very slow. Therefore it is recommended setting **Size of RAM** < physical RAM.

Installation of the PMOD Environment

The installation is started by the **Install** button. The Pmod4.1 directory is created wherein all PMOD-related files are extracted. If the installing user has no write permission in the parent directory, a dialog window appears which reports an installation problem. In this case please change the writing permissions of the installation as root user, or try the installation again using a different installation directory.

At the end of the installation a dialog window is shown. It indicates the command script for starting Pmod4.1. If this is the first PMOD installation, **Close** the window.

If a prior PMOD version has been used already, it is recommended importing its working environment. To this end, activate **Copy Configuration ...** and select the **properties** folder of your prior PMOD installation with the **Browse** button as illustrated below. Then activate **Copy** to import the setting, and **Close** the window.
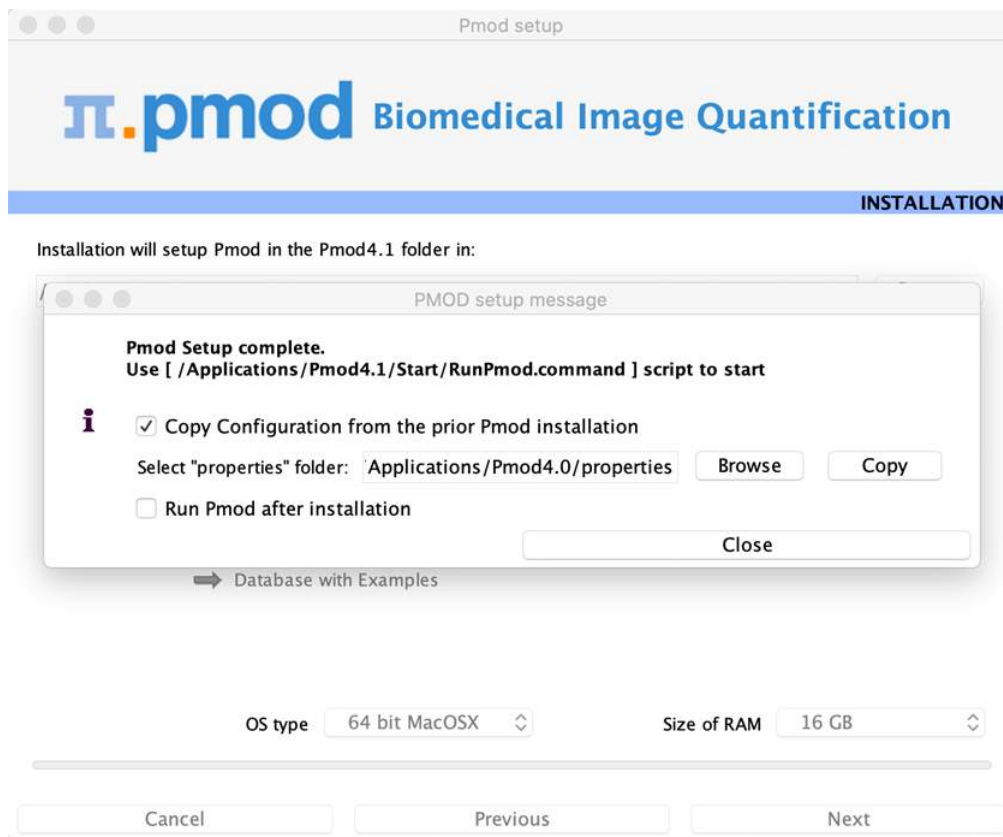
## 1.3   PMOD Stand-alone License Installation

Install USB Key Drivers

All the files required for the driver installation have been extracted during the installation of the PMOD software and stored in the PMOD directory tree. Browse to the directory
/Applications/Pmod4.1/install/hksetup/MacOSX

First double-click **WkRuntimeUser_6.51.500.dmg**, then **WkInstall.pkg,** and perform a standard installation

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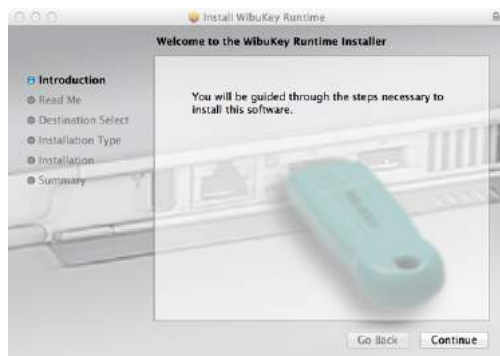
Note that the network components don't need do be installed and can be unchecked as illustrated below,
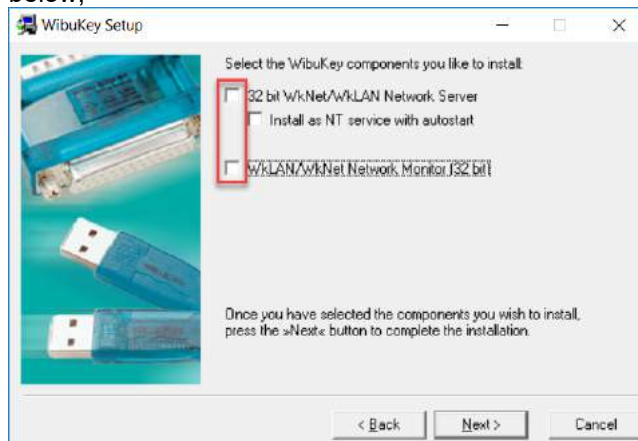
> **Note:** If you experience problems during driver installation, you are recommended downloading the most recent drivers for the WIBU-KEY (**WibuKey Runtime**) and try the installation again. Also, in some cases, a reboot may be required after driver installation.

License File

The delivery note you have received with the PMOD installation package contains account information for logging into the support area of **www.pmod.com**. There you will find a license report, and a button for downloading the license file for your purchased configuration. Please download pstarter.lcs and copy it to the directory */Applications/Pmod4.1/system/lcs.*

> **Important Note:** Please do not change pstarter.lcs in any way - a modified license file will not be accepted. Do not open pstarter.lcs in any program, do not rename it, and if you transfer it per FTP, use binary transfer.

Start PMOD

PMOD can now be started by double-clicking the **RunPmod.command** script in */Applications/Pmod4.1/Start/.* Depending on the selected configuration it contains the following commands:

```
cd '/Applications/Pmod4.1'
./java/jre/bin/java -Xmx16000M -jar pmod.jar
```

Alternatively, the script can be dragged once from the finder to the Mac OS X taskbar to create a shortcut. From then on, PMOD can be started using this shortcut.

> **Notes:**
>
> The script has been tailored to the installation directory. Therefore, if the Pmod4.1 directory is moved to a different location, the path needs to be adjusted.
>
> The **-Xmx16000M** option specifies the maximum heap memory (8000 MB) that PMOD can allocate. To process large data sets this number should be increased. Caution: The P3D tool may crash, when the reserved space approaches the physical RAM size.

Change Permission Settings of Directories for writing

To allow other users than root the full usage of PMOD it is important to open some key PMOD directories for writing:

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```
chmod -R ugo+w /Applications/Pmod4.1/properties
chmod -R ugo+w /Applications/Pmod4.1/data
```

There may be other directories you have to open for writing later on, if several users are working with the same PMOD installation.

1.4 PMOD Network License Installation

1.4.1 PMOD License Server Installation

PMOD Software Installation

The computer for the PMOD license server doesn't require a high performance (e.g. 2GB RAM, 20GB free space on HDD, 64-bit OS), but needs to have access to the WIBU key USB dongle and run continually. Therefore, a robust vintage machine is sufficient as a PMOD license server. Preferably, it is dedicated to serving the PMOD license, because the license server is a standard process rather than a Windows service.

When using a Virtual Machine for PMOD license serving, the USB device from the host server needs to be mapped to the selected Virtual Machine. If there are no USB ports in a host server or the mapping is not possible, a Network USB Device Server can be used. USB hubs from Digi Network, **Silex**, and Belkin have been tested by Wibu-Systems. In such a setup, the WIBU key can be served over the network and mapped to the Virtual Machine. The standard WIBU drivers can be installed and used at the Virtual Machine.

To install the PMOD license server first perform the steps described in the **Stand-alone PMOD Installation** 8 including copying of the license file and plugging the USB key in.

Starting the License Server

The PMOD license server can then be started by executing the **RunLcsSvr.command** script in */Applications/Pmod4.1/Start* containing the following lines (64-Bit version)

```
cd '/Applications/Pmod4.1'
./java/jre/bin/java -Xmx2G -jar pmtsvr.jar 5000 -ls
```

The meaning of the command arguments is:
-Xmx2G: Size allocated to the license server
5000:IP port over which the license server communicates
-ls: license server only, no data sharing
-d:This option can be added for more verbose output

> **Note:** The script has been tailored to the installation directory. Therefore, if the Pmod4.1 directory is moved to a different location, the path needs to be adjusted.

Log Output

The command window will show startup information and log the checking out/in events as illustrated below. In this example, two clients are started, and then the one of them is stopped again.

```
MD03845:/Applications/Pmod4.1/Start/RunLcsSvr.command
***
```

```
Started on license [9]
***
 License Server [Version 3.901 A  (c) 1996 - 2016 by PMOD Technologies]
 Verbose: false, Secure: false, Compressed: false
***
 Port: 5000
 Started on: PMOD-CB2/192.168.55.103
 License Server: [ ON ] STANDALONE (Use <Ctrl+C> to stop), Number of
Server Licenses: 3
 Memory Assigned: 1820 MB
--> License Server started [Fri Jul 25 16:43:40 CEST 2014] : on port
5000
 1) 127.0.0.1-192.168.55.103
 Number of free licenses: 2

 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 Number of free licenses: 1

===> REMOVE: 192.168.55.104-192.168.55.104, 1406299586017
 1) 127.0.0.1-192.168.55.103
 Number of free licenses: 2

===> REMOVE: 192.168.55.104-192.168.55.104, 1406299586017
 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 Number of free licenses: 1

 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 3) 127.0.0.1-192.168.55.103
 Number of free licenses: 0
```
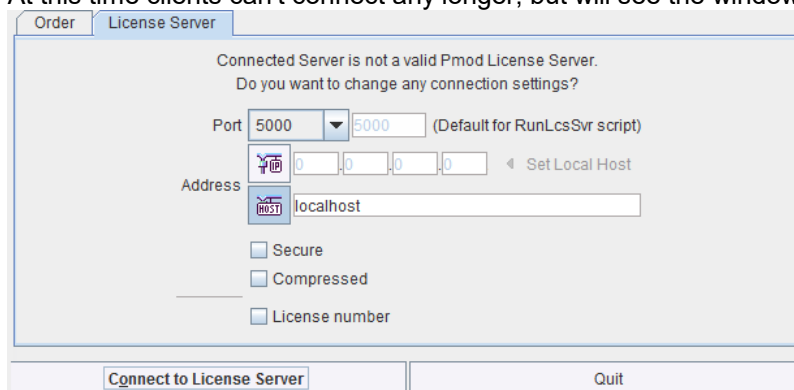
At this time clients can't connect any longer, but will see the window illustrated below.

Another client needs to stop

```
===> REMOVE: 192.168.55.104-192.168.55.104, 1406299700154
 1) 127.0.0.1-192.168.55.103
 2) 127.0.0.1-192.168.55.103
 Number of free licenses: 1
```

before connection is possible again and **Connect to License Server** will work.

Multiple Licenses Management

Multiple licenses can be served by a single PMOD installation. In order to use this feature please rename the different license files (*pstarter.lcs*) by appending the license numbers in square brackets (*pstarter[1324].lcs*, *pstarter[427].lcs*, ...) and copy them into the *Pmod3.7/system/lcs* folder. There are two scenarios, a single license server managing multiple licenses simultaneously, or a separate license server for each license.

If the license server script *RunLcsSvr.bat* is started without modification, it will manage all licenses found in the directory. A specific license can then be defined in the *RunPmod.bat* script of the client

by the command line option "-lsn[<PORT_NO>.<OPTIONAL_LICENSE_NO>@<IP_ADDRESS>]",
e.g.:
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5000.1324@192.168.55.103]
```
- to acquire license 1324
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5000.427@192.168.55.103] -
```
to acquire license 427

In order to operate a dedicated server for each license please create a separate server script for each license with the "-lic[<pattern>]" option included, e.g.
```
java -Xmx2G -jar pmtsvr.jar 5000 -ls -lic[1324]
java -Xmx2G -jar pmtsvr.jar 5001 -ls -lic[427]
```
A specific license can then be defined in the *RunPmod.bat* script of the client by the command line option "-lsn[<PORT_NO>@<IP_ADDRESS>]" e.g.
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5000@192.168.55.103]
```
- to acquire license 1324
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5001@192.168.55.103]
```
- to acquire license 427

The advantage of separate servers is that the processes can be independently started, stopped and monitored.

Emergency Restart

In the case of connection or license management problems the following procedure is recommended for restoring clean license handling:

1. Stop the license server.

2. Delete the contents of the *Pmod4.1/system/lcs/lct/* directory.

3. Start the license server again.

If this procedure is completed within 5 minutes, no shutdown of running PMOD clients is required.

1.4.2   PMOD Network Clients Installation and Configuration

PMOD Software Installation

For a PMOD client only the software extraction of the **Stand-Alone PMOD installation** is required. *The license file should not be copied.*

Configuration of the License Server

The PMOD client can then be started by the command script **RunPmod.command** in the *Pmod4.1/Start* directory. As no license file is found, the following dialog window is shown.
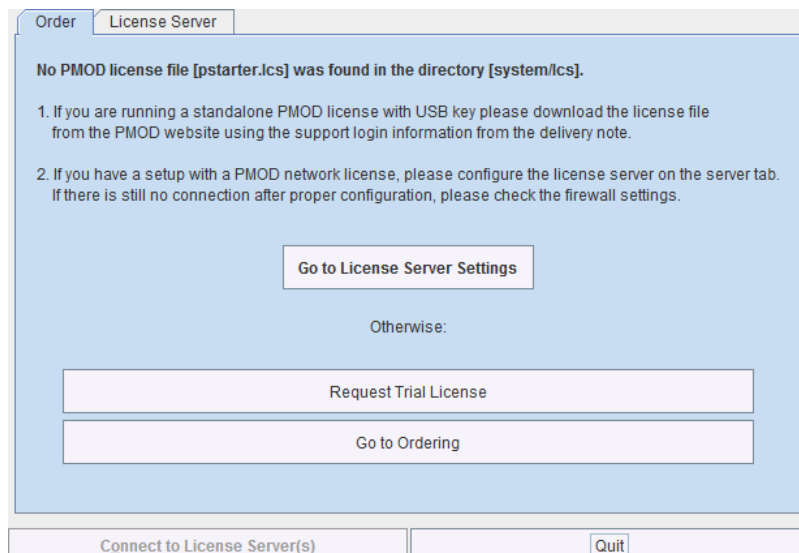
Please select the **Go to License Server Settings** button to open the License server panel illustrated below.
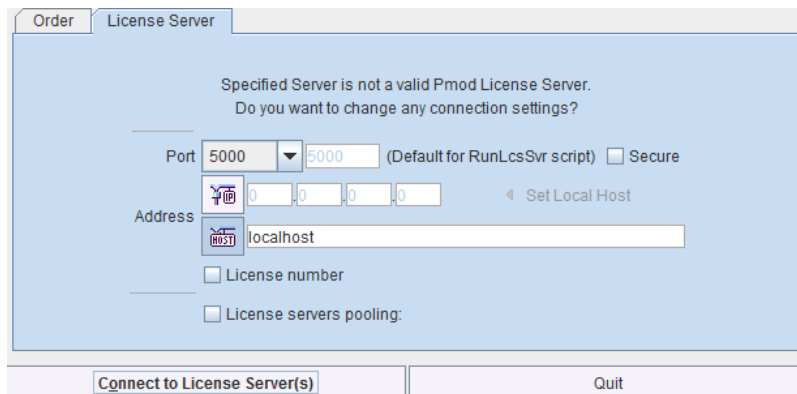
Please configure the same **Port** that you have configured for the license server (or transaction server), and specify the server **Address** either by entering its IP address, or by entering its host name. If the process employed for license serving uses compression or encryption, please check the appropriate boxes. If the license server manages several licenses at the same time, enable the **License number** box and enter the number of the license to which you want to connect. Then activate **Yes**.

If the connection succeeds, the dialog window disappears and PMOD starts up. Otherwise the dialog
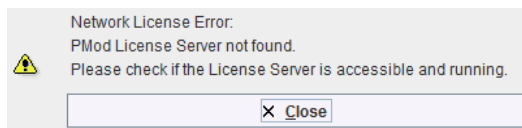

is shown. In this case, please check the configuration of the license server and try again.

If a customer has multiple license servers, the proper license server can also be specified in **RunPmod.command** as a client command line option by:
`-lsn[<PORT_NO>.<OPTIONAL_LICENSE_NO>@<IP_ADDRESS>]`

Alternatively muliple license servers can be added in the **License servers pooling** configuration by entering their definition in the upper area and then using the **+** button. Each time the client is started it will connect to the first license server in the list which responds.
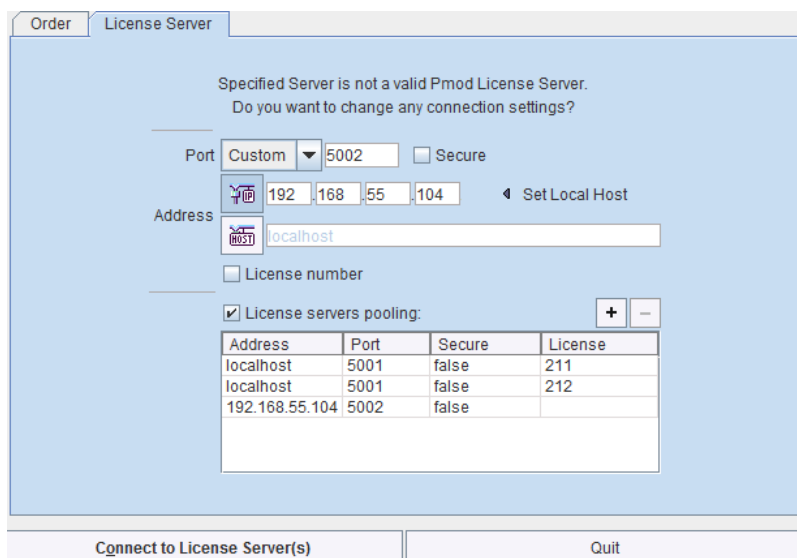
License Server Change and Statistics

The license server setting is available on the **On Start** panel of the **Config** tool. The **Change License Server** button opens a dialog window for changing the license server address. If a license server handles multiple network licenses, the **License number** field can be used to address a specific license.
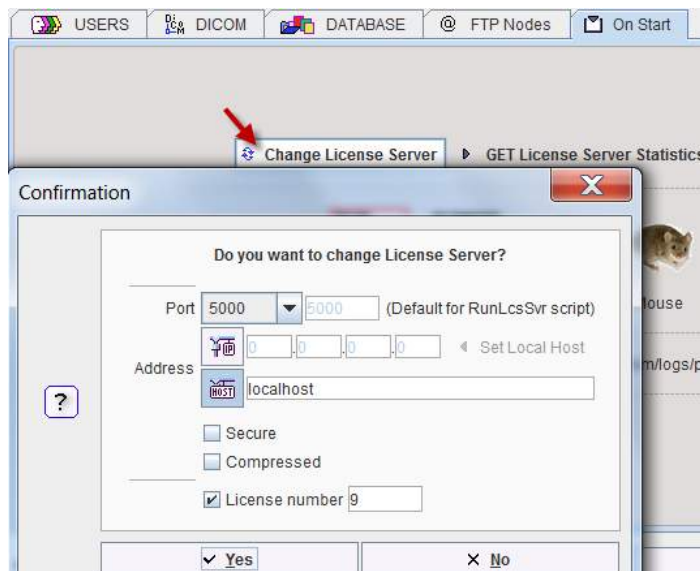
The **GET License Server Statistics** button allows finding out whether there are free licenses left.

Starting and Stopping a PMOD Client

After the license server has been properly configured, PMOD can be started in exactly the same way as with a stand-alone installation. However, for stopping PMOD the main **Quit** button of the ToolBox should always be used. This will initiate a proper shutdown procedure which returns the license to the license server. Otherwise, when simply killing the client, it will take about 15 minutes until the license server diagnoses loss of connection and reclaims the lost license.

Connection Problems

If at client startup no more licenses are available from the license server because all are in use, the **License Server** connection dialog window is shown again to give the user a chance for connecting to a different license server. In case the connection is repeated with the same server following message is shown.
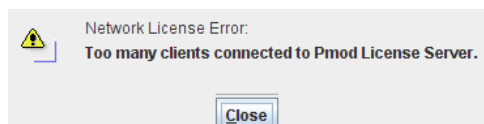
If a connection problem with the license server occurs while working, the **License Server** connection dialog window is shown. If it is not possible to re-establish the connection (for instance by restarting the license server) the following warning is displayed
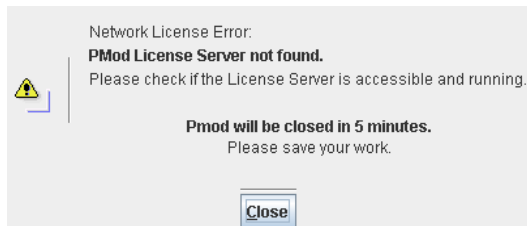
and after five more minutes the PMOD client is finally stopped.

1.4.3   Combination of License and Database Server

Please note that the license server process is based on the transaction server mechanism used for publishing a database. Therefore, if the user is already running a transaction server process on the server system (RunDbSvr.command, see Setting up a Transaction Server), it is *not* necessary to start a dedicated process (RunLcsSvr.command) just for the license management. The clients can use the same port for requesting a license as for requesting data from the transaction server.

In this context the transaction server option
`-noLS`: database server only
is relevant. This option should be used when running multiple transaction servers. In this case, only one of the transaction servers should started without `-noLS`, namely the one used for license serving.

1.5   Version Upgrade in a Complex PMOD Environment

Upgrading a standalone installation of PMOD is straightforward. When using absolute paths for the databases the new PMOD version should be immediately functional after copying the properties folder as the last installation step.

In a more complex environment with clients and servers the following rules should be observed:

1. Absolute paths outside the PMOD installation directory should be used for the databases. If this is not the case they should be moved and the paths adjusted in the configuration.

2. The databases should be backed up before the migration.

3. Server and clients should preferably run the same PMOD version. (To some extent, newer server versions can support older client versions, but not reverse.)

4. The PMOD version on the server should be updated first, followed by the clients.

Server Update

Please perform the following tasks sequentially:

1. Stop all PMOD servers in the order DICOM servers (DS), transaction servers (TS), license servers (LS).

2. Install the new PMOD version and import the properties from the old installation.

3. In **Config**/**DATABASE** switch each database to **Use Direct Connection**, verify it with **Echo DB**, and run **Update & Optimize**. Then switch back to **Use Transaction Server** and generate new starting scripts for the transaction and license servers.

4. In **Config**/**DICOM**/**DICOM SERVER** generate new scripts for the DICOM Servers.

5. Save the configuration and exit PMOD.

6. Start the DICOM, transaction and license servers using the new scripts.

7. Start PMOD and verify with the **Config** utility, that the TS and DS are working properly. To this end use **Echo TS** and **C-Echo**.

8. In case of a network license: Exit PMOD and restart the license server (otherwise a license is blocked).

Client Update

1. Install the new PMOD version and import the properties from the old installation. For ATL installations the old properties are not required, as the configuration is centrally stored.

2. Start PMOD, provide the license server details when using a network license, and verify the connections with the transaction and DICOM servers.

1.6   Troubleshooting

Error reporting

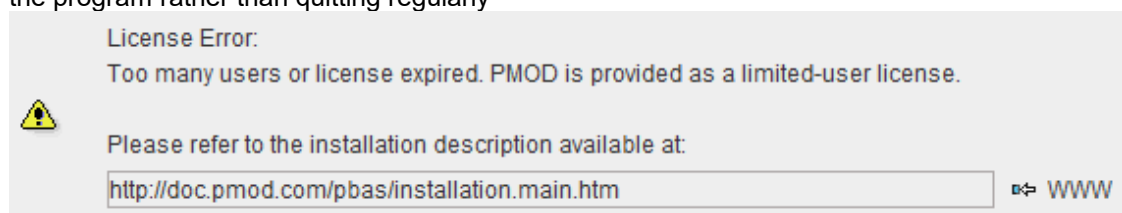Internal errors typically leave messages of the form

```
java.lang.NullPointerException
at
pmclass.applications.pmgateway.PMgatewayDefaults.getConvertionSettings(P
MgatewayDefaults.java:143)
at
pmclass.applications.pmgateway.PMgatewayFrame.convert(PMgatewayFrame.jav
a:854)
at
pmclass.applications.pmgateway.PMgatewayFrame.run(PMgatewayFrame.java:91
1)
at java.lang.Thread.run(Thread.java:484)
```

in the command window or the log file.

To allow PMOD Technologies tracking the problem please report the error using the in-built reporting mechanism as described in the problem reporting section. If this is not possible due to a firewall problem please open the **Support Request** section on the www.pmod.com website and fill the error message together with a description into the problem report form.
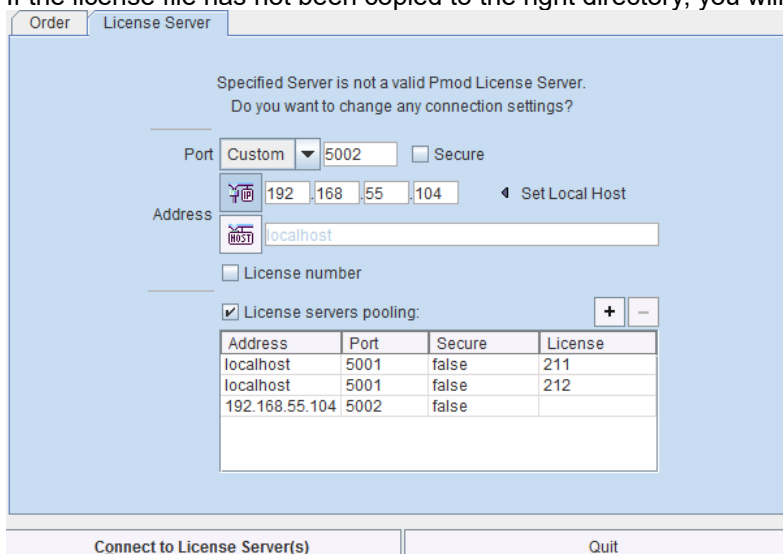
License Errors

Some of the most likely license errors are:

▪ The following error message might appear when restarting PMOD after a crash or after killing the program rather than quitting regularly

License Error:
Too many users or license expired. PMOD is provided as a limited-user license.

⚠

Please refer to the installation description available at:

http://doc.pmod.com/pbas/installation.main.htm   ◖⇦ WWW

- If the license file has not been copied to the right directory, you will see a message

Please copy *pstarter.lcs* to */Applications/Pmod4.1*/system/lcs

- If the license file has been modified somehow, you will see a message
License Error. Invalid license file (2)
Please try to extract *pstarter.lcs* again from your e-mail without any modifications.

- If the USB key cannot be read because it is not connected or because the driver installation is not up to date, you will see an error message *Hardware license key not accessible* with additional details.
Please make sure that the USB key is connected and the installation was done as described. The installation may have to be repeated after an operating system upgrade.

3D Rendering Problems

The 3D rendering solution of PMOD may fail on some older MacOSX systems. Please try solving the problem as follows:

1. Java is already installed on Machine:

- copy content of "Pmod4.1/Pmod/java/ext/j3d" to "/Library/Java/Extensions"

- check whether 3D works in PMOD

- if not, install Java 1.8 using the latest installer form the Oracle **download page** and copy content of "Pmod4.1/java/ext/j3d" to "/Library/Java/Extensions"

- check whether 3D works in PMOD

- if not, there is no simple solution at this time.

2. Java is not yet installed on Machine

- install Java 1.8 using the latest installer form the Oracle **download page** and copy content of "Pmod4.1/java/ext/j3d" to "/Library/Java/Extensions"

- check whether 3D works in PMOD

- if not, there is no simple solution at this time, please contact support@pmod.com.

R Plotting Problems

If plots are not shown or very slowly, an update of X11 is required. Please install XQuartz from http://xquartz.macosforge.org/.