PMOD Installation on Linux Systems

Version 3.3

π.pmod

PMOD Technologies

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 *properties/system/lcs*).

During program startup the license information encoded in the USB key is read and compared with 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 checking is successful, the PMOD ToolBox appears showing the purchased modules, and processing can start. Note that the USB key must remain in place while running PMOD.

Licensing, Network Licenses

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 a few minutes. On the other hand, if the license server is stopped, the clients show a warning message 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. The license server PMOD installation is only intended for server purposes and not for data processing. Note that the USB key must be connected at all times.

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 that the license server and the clients must run the same PMOD version.

Java Runtime Environment (JRE)

The entire PMOD software has been programmed in Java and therefore requires an appropriate Java Runtime Environment (JRE) to be executed. During PMOD installation on Linux and Windows systems, 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 on Windows and Linux. Only on MacOSX systems, the built-in JRE will be used.

Installation Steps

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

1) Extraction of the PMOD program files, the JRE, and the example data to the *Pmod3.3* directory in a user-defined location.
   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 http://www.pmod.com/technologies/support/enter-support.php* after the personalized login (please see the delivery note of your PMOD package for login information).
   This installation step is required for: **Stand-alone Installation**, **License Server**.

Linux Installation

The installation for all types of PMOD systems starts with the software extraction from the installation DVD. No other installation is required for PMOD network clients. For PMOD standalone systems and PMOD license server systems, the USB protection key drivers must then be installed and the dedicated license file copied to the *properties/system/lcs* folder.

Some parts of the PMOD installation may require root privileges. If your account does not have these rights, please ask your IT support to perform the following installation steps.

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 DVD. Then start the installer by executing **RunSetup_32** or **RunSetup_64** in the *Setup/Linux* directory on the DVD by double-clicking, depending on your operating system. New systems are typically 64 Bit, so it is recommended to try **RunSetup_64** first.

The following installation screen appears
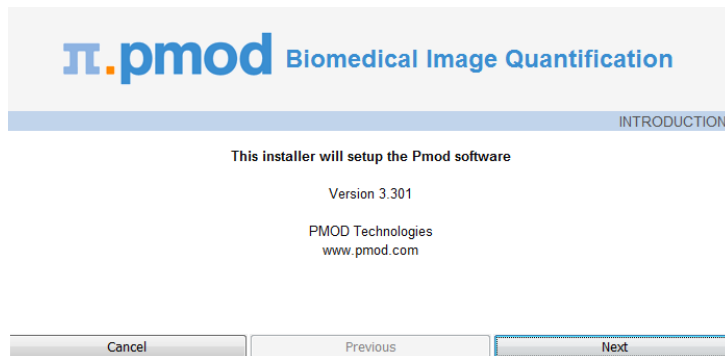
Please use **Next** to proceed and accept the license agreement in the appearing dialog window. After activating **Next** the window for configuring the installation appears.
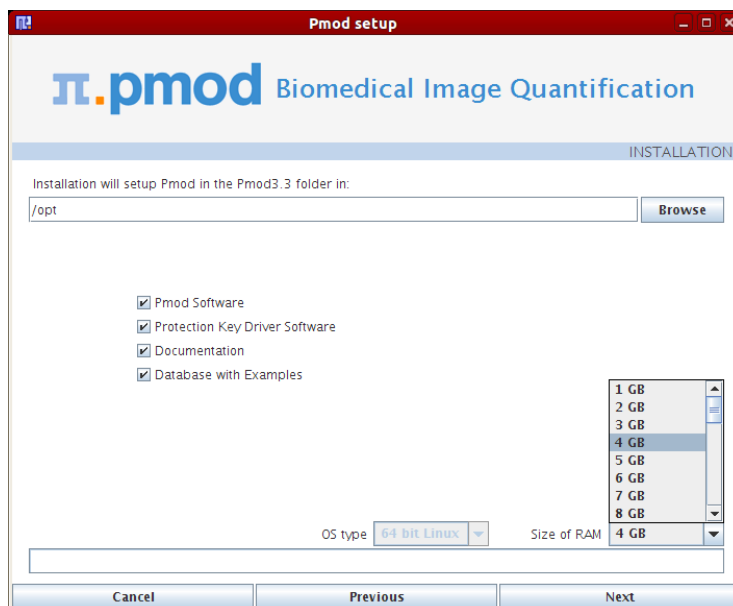
Please perform the following configurations:

Installation Path

Use the **Browse** button to select the parent directory for the installation for which the installing user has writing permissions. There, the installer will create a new directory **Pmod3.3** for the program files and the data. Please make sure that 450MB of free space is available.

Packages

It is recommended to install all four packages, the **Software**, the **Protection Key Driver Software**, the **Documentation**, and the **Example Database**. The **Example Database** requires about 120MB, but will be a great help for getting acquainted with the programs because they provide examples for the the different types of analysis. Furthermore, you will already have a database for storing your data.

Properties of Operating System and RAM

Current operating systems (**OS**) support the 64-Bit capability of new hardware. The main advantage of using a 64-Bit OS is the extended address space for the applications, in this case PMOD. Consequently, the data size is virtually unlimited for a 64-Bit OS (only limited by hardware RAM), while it is limited to <2GB for a 32-Bit system. As there is a clear trend towards rapidly increasing image data sizes, we recommend setting up 64-Bit systems for PMOD.

If the operating system of your target computer is 32-Bit, then please set the **OS type** selection to **32-Bit**. Correspondingly, only **Size of RAM** of **1GB** of **2GB** can be selected, preferably **2GB**.

If the operating system of your target computer is 64-Bit, then please set the **OS type** selection to **64-Bit**. In this case, **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 Pmod3.3 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 Pmod3.3, and allows importing the configurations from a prior version. To this end, select the **properties** folder of your prior installation with the **Browse** button as illustrated below, and activate **Copy Configurations**. This import will also copy the license file, so that Pmod3.3 should immediately run with the familiar environment if your license is valid with the Pmod3.3 version.
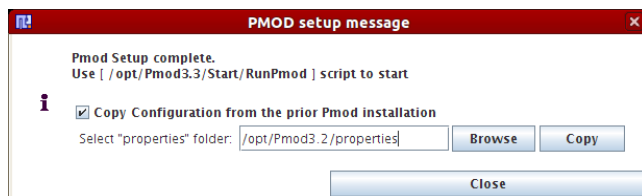
Stand-alone PMOD Installation with USB Key Protection

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 *hksetup* sub-directory. For Linux, it includes four installation files, the 32-Bit and 64-Bit installers for RedHat/Fedora as well as Ubuntu/Debian systems. The driver installation should be preformed as *root* user.

On Ubuntu/Debian Linux systems double-click **WkRt-Lin32_6.0.501_i386.deb** (32-Bit) or **WkRt-Lin64_6.0.501_amd64.deb** (64-Bit) depending on the architecture of your host system, and then install the package.

Similarly, on RedHat/Fedora Linux systems use **WkRt-Lin32-6.0.501_i386.rpm** (32-Bit) or **WkRt-Lin64-6.0.501_amd64.rpm** (64-Bit). If the installation per double-clicking does not work open a terminal and enter the command
```
cd /opt/Pmod3.3/hksetup/Linux
rpm -i WkRt-Lin64-6.0.501_amd64.rpm
```
(or `rpm -i WkRt-Lin32-6.0.501_i386.rpm`)

If a message *usbutils conflicts with WkRt-Lin-5.20.500-1* occurs on the console, please cancel the installation of WkRt-Lin-5.20.500-1.i386.rpm and enter the command:
```
rpm -e --nodeps usbutils
```
to uninstall conflicting USB support.

If messages occur in the console window indicating a conflict with an older version of the driver please uninstall that prior version (eg. WkRt-Lin-5.10.501-1.i386) by entering the command:

```
rpm -e WkRt-Lin-5.10.501-1.i386
```

After these cleaning procedures try the installation again.

Note: If you experience problems during driver installation, you are recommended downloading the most recent drivers for the WIBU-KEY (Runtime Kit) from *http://wibu.com/download_user.php* (*http://wibu.com/download_user.php*) and try the installation again. Also, in some cases, a reboot may be required after driver installation.

License File

In the delivery note you have received with the PMOD CD you find account information for logging into the support area of *www.pmod.com* (*http://www.pmod.com/technologies/support/enter-support.php*). 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 *Pmod3.3/properties/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 with command script **RunPmod** in *Pmod3.3/Start.* Example:

```
!/bin/sh
cd /opt/Pmod3.3
.\java\jre\bin\java -version
.\java\jre\bin\java -Xmx1800M -jar pmod.jar
```

Notes:

The script has been tailored to the installation directory. Therefore, if the Pmod3.3 directory is moved to a different location, the path needs to be adjusted.

The **-Xmx4000M** option specifies the maximum heap memory (4000 MB) that PMOD can allocate. To process large data sets this number should be increased. However, please note that currently there is an operating-system dependent *limitation on 32-Bit operating systems*: only a maximum of 1800M can be allocated, even if the physical RAM size is larger. Increasing -Xmx beyond 1800M might result in an error *Could not reserve enough space for object heap*. 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 PMOD directories for writing:

```
chmod -R ugo+w /opt/Pmod3.3/properties
chmod -R ugo+w /opt/Pmod3.3/data/
```

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

PMOD License Server and Clients

In case a number of network licenses have been purchased, a dedicated license server installation is required. The installation should be performed on a server computer which is continuously running the PMOD license server program.

Note that the operating systems of the clients and the server need not be the same.

PMOD License Server Installation

To install the PMOD license server first perform the steps described in the *Stand-alone PMOD Installation* (on page 5). Then the PMOD license server can be started by executing the **RunLcsSvr** script in *Pmod3.3/Start* containing the following lines

```
!/bin/sh
cd /opt/Pmod3.3
.\java\jre\bin\java -version
.\java\jre\bin\java -Xmx2G -jar pmtsvr.jar 5000 -LS -d
```

The meaning of the command arguments is:

5000: IP port over which the license server communicates
-LS: license server only, no data sharing
-d: verbose output

Note: The script has been tailored to the installation directory. Therefore, if the Pmod3.3 directory is moved to a different location, the path needs to be adjusted.

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:/opt # Pmod3.3/Start/RunLcsSvr
***
***
 Started on license [912]
***
License Server [Version 3.301 A  (c) 1996 - 2011 by PMOD
Technologies]
Verbose: true, Secure: false, Compressed: false
***
 Port: 5000
 Started on: PMOD-ASUS/192.168.55.109
 License Server: [ ON ] STANDALONE, Number of Server Licenses: 3
 Memory Assigned: 1160 MB
--> License Server started [Tue Oct 25 15:38:19 CEST 2011] : on port
5000
 [20111025 15:39:27.890] LCS: ADDED CLIENT [192.168.55.102-
192.168.55.102].
 Active LCS clients:
 1) 192.168.55.102-192.168.55.102
 Number of free licenses: 2

 2011.10.25 - 15:39:28 [5000] -> 192.168.55.102 -> GET TS Version ->
3.301


[20111025 15:39:41.156] LCS: ADDED CLIENT [192.168.55.102-
192.168.55.102].
Active LCS clients:
 1) 192.168.55.102-192.168.55.102
 2) 192.168.55.102-192.168.55.102
 Number of free licenses: 1

2011.10.25 - 15:39:41 [5000] -> 192.168.55.102 -> GET TS Version ->
3.301
[20111025 15:39:54.234] LCS Command: REMOVED CLIENT [192.168.55.102-
192.168.55.102]. Active clients:
 1) 192.168.55.102-192.168.55.102
 Number of free licenses: 2
```

Combination of License and Database Server

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

Note that there is an additional transaction server option
−noLS: database server only
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.

PMOD Client Installation and Configuration

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

The PMOD client can the be started by the command script **RunPmod.bat** in the *Pmod3.3/Start* directory. As no license file is found, the following dialog window is shown.
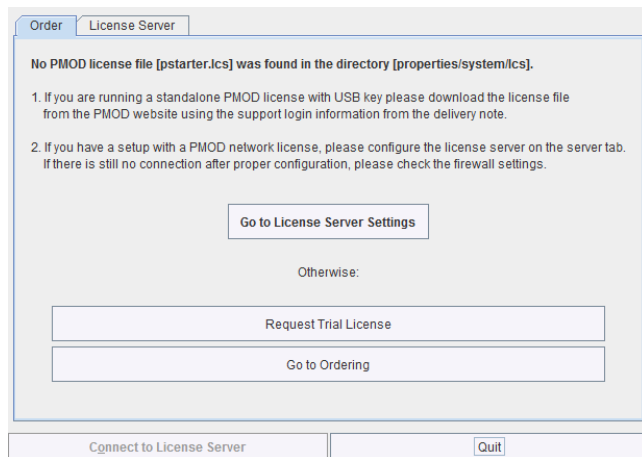

Please select the **Go to License Server Settings** button to open the License server panel illustrated below.
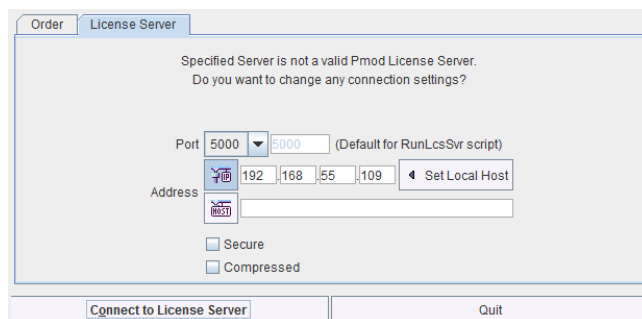
Please configure the same **Port** that you have configured for the license server (or transaction server), and specify the server **Address** either by entering its IP address, or by entering its host name. If the process employed for license serving uses compression or encryption, please check the appropriate boxes. Then activate **Yes**.

If the connection succeeds, the dialog window disappears and PMOD starts up. Otherwise the dialog
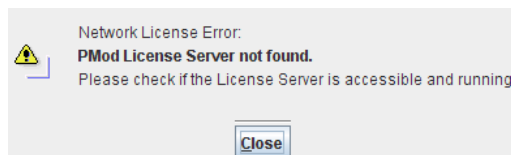
is shown. In this case, please check the configuration of the license server and try again.

If no more licenses are available from the license server because all are in use, the 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.
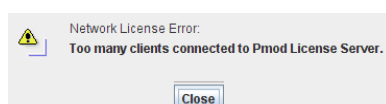
If a connection problem with the license server occurs while working with a PMOD client, the connection dialog window is shown. If you are not able to re-establish the connection the following warning is displayed.
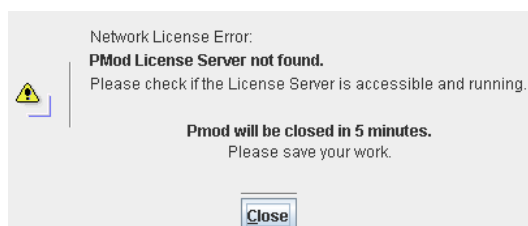
If it is not possible to connect to the license server within five minutes the PMOD client is finally stopped.

Troubleshooting

Error reporting

Internal errors typically leave messages of the form

```
java.lang.NullPointerException

at
pmclass.applications.pmgateway.PMgatewayDefaults.getConvertionSettin
gs(PMgatewayDefaults.java:143)
at
pmclass.applications.pmgateway.PMgatewayFrame.convert(PMgatewayFrame
.java:854)
at
pmclass.applications.pmgateway.PMgatewayFrame.run(PMgatewayFrame.jav
a:911)
at java.lang.Thread.run(Thread.java:484)
```

in the command window.

To allow PMOD Technologies tracking the problem please report the error using the in-build reporting mechanism as described in the problem reporting section. If this is not possible due to a firewall problem please log into the support 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:

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

Order	License Server

Specified Server is not a valid Pmod License Server.
Do you want to change any connection settings?

Port 5000 ▼ 5000 (Default for RunLcsSvr script)

Address 192 . 168 . 55 . 109 ◀ Set Local Host

☐ Secure
☐ Compressed

Connect to License Server	Quit
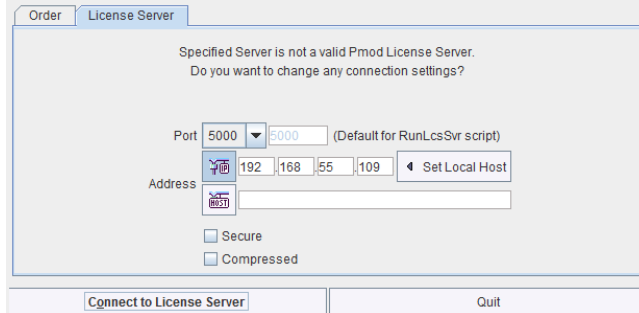
Please copy *pstarter.lcs* to *Pmod3.3/properties/system/lcs*

⇥ 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.

⇥ In order to be able to run PMOD with the USB key, the JNI must be found during
startup. To this end the environment variable LD_LIBRARY_PATH must contain the
path */usr/lib*. The most appropriate location to define it would be in a global definition
file, eg */etc/csh.cshrc*. If not already defined so, add
```
setenv LD_LIBRARY_PATH /usr/lib
```

Generation of Quicktime Movies fails

In some installation the generation of Quicktime movies fails because of library problems. It
is therefore recommended to install the **Java Media Framework** (JMF) which can be
downloaded from:
http://java.sun.com/products/java-media/jmf/2.1.1/download.html

Reading of Compressed DICOM images fails

In some installation the reading of compressed DICOM data fails because of library
problems. It is therefore recommended to install the **Java Advanced Image I/O Tools** which
can be downloaded from:
*https://jai-imageio.dev.java.net/binary-builds.html*

Additional Solutions

For checking additional solutions please consult the *Q&A area of the PMOD website
http://www.pmod.com/technologies/support/faq/QA.php*.

Problem Reporting

PMOD includes a functionality to directly send a problem report to the support staff of PMOD Technologies. This report can include the log output, screen captures and a problem description entered by the user.

Every PMOD tool contains in the lower left bottom line the functions for creating the report.
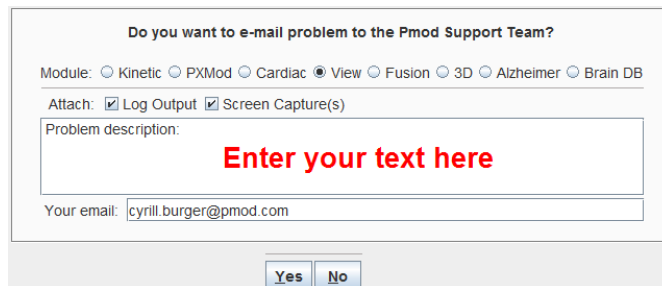

The capture button ⬛ creates a capture of the entire screen (not only the PMOD window) and adds it to a buffer of up to 20 captures. The console button ⬛ opens the a **Console** dialog window illustrated below.
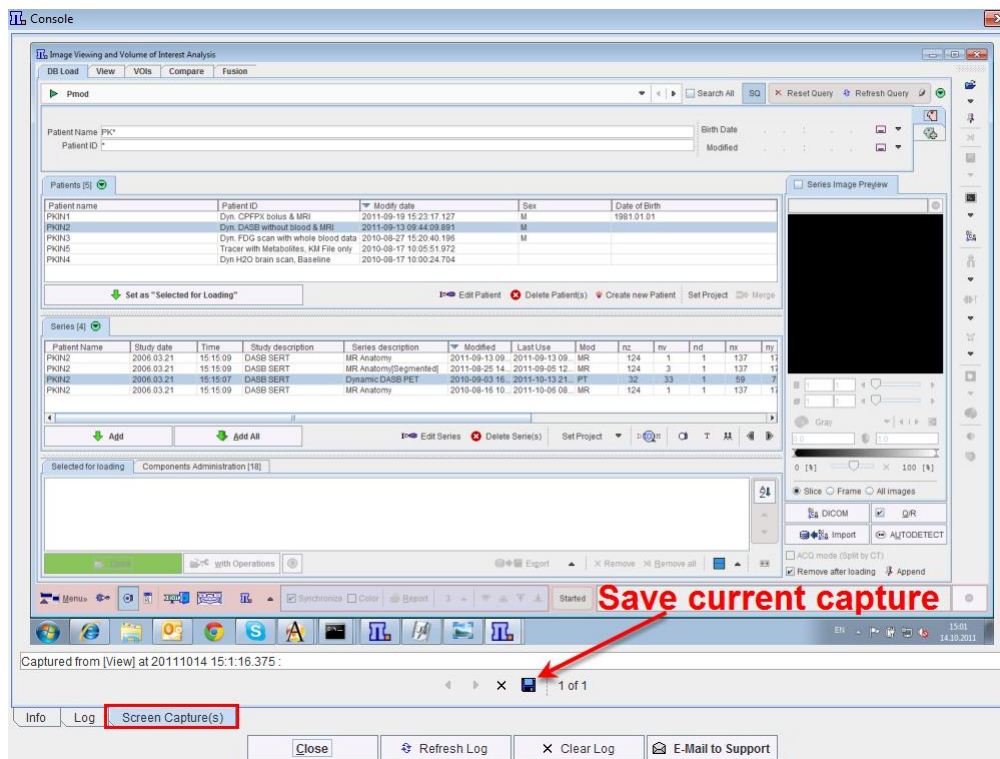
The captures can be inspected on the **Screen Capture(s)** pane with the left/right arrow buttons, and the current one saved in JPEG. The **Log** pane contains the log messages, if the terminal output has been configured to be saved in a file on the **On Start** tab of the **Users Configuration**. Its contents can be updated by the **Refresh Log** button. Once in a while it is recommended to use **Clear Log**, to an avoid excessive length of the log file. The **Info** contains some more general information.

To submit a problem description please activate the **E-mail to Support** button. It opens a dialog window,

wherein the user can select the affected **Module**, and confirm whether the **Log Output** and the **Screen Capture(s)** should be included. The problem description should be typed into the text field, and the user's email address into the **Your email** field. Note that multiple addresses can be specified, separated by the colon character (;). use the **Yes** button to submit the report, or **No** to cancel.

Note: Although the standard mailing port is used, corporate firewalls may prevent PMOD from submitting the e-mail. In this case a notification will be shown, and the user needs to report the problem either through his support login, or by standard e-mail.