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# ooRexx

## Documentation 4.2.0

### Open Object Rexx™

#### Release Notes

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## 1. About The 4.2.0 Release

Open Object Rexx Version 4.2.0 is based on the previous bug fix version of ooRexx™ (4.1.3). Version 4.2.0 has both enhancements and bug fixes.



## IMPORTANT

If you have a version of IBM Object Rexx™ installed on your system, you must remove it before starting with the installation of this package. The two packages, Object Rexx and ooRexx can not be installed side-by-side.

Note that an upgrade type installation is not supported on any platform. If a previous version of ooRexx is installed, it should be completely uninstalled prior to installing 4.0.0. Failure to completely uninstall the previous version will produce unpredictable results.

On a Unix-like system use the appropriate package manager to uninstall the previous version. For instance, on Linux with a rpm install, you could use the command:

```
rpm -iv ooRexx
```

to uninstall ooRexx. On a Debian-based system you could use the **-r** or the **-P** option of **dpkg** to uninstall ooRexx:

```
dpkg -P ooRexx
```

On Windows, when the installation program is started, the installer will recognize that a previous version is installed. It will then present an option to uninstall the previous version before proceeding with the 4.2.0 install. Alternatively, you can completely uninstall the previous version prior to starting the 4.2.0 installation.



## Warning

*On Windows only.* If a previous Windows install exists and is not the same addressing mode (32 or 64) as the version of ooRexx about to be installed, there are potential problems when the uninstaller is launched from the installer automatically. In this case it is **strongly** advised that the uninstallation program be run first to completely uninstall the current version of ooRexx, and then the new installer be run.

## 1.1. New in this Release

### In General:

For the ooRexx 4.2.0 release, changes have been relatively well documented through the Tracker feature of the ooRexx project on SourceForge. The ticket number and the ticket title of each change is recorded in the CHANGES document. If more information is desired, look up the tracker item on SourceForge.

The Bug tracker is located at: [ooRexx Bug Tracker](#)<sup>1</sup>

The Requests For Enhancement tracker is located at: [ooRexx Feature Requests Tracker](#)<sup>2</sup>

The Documentation Bugs tracker is located at: [ooRexx Documentation Bug Tracker](#)<sup>3</sup>

To search for a single ticket number, in any of the trackers, enter **ticket\_num:Number** in the search field of the tracker. For instance to search for ticket number 200, enter **ticket\_num:200**

### In Windows ooRexx Only:

The version of ooDialog distributed in ooRexx 4.2.0 is ooDialog 4.2.3.

Beginning with ooDialog version 4.2.0, released August 2012, both the ooDialog version number and the installation of ooDialog itself have been decoupled from the ooRexx interpreter.

Any version of ooDialog from version 4.0.0 to version 4.2.3 can be installed into an ooRexx 4.2.0 installation. The ooDialog version installed completely replaces whatever version of ooDialog is currently installed.

ooDialog versions can be downloaded from SourceForge at: [ooRexx Files ooDialog](#)<sup>4</sup>

ooDialog version 4.2.0 was completely rewritten from the original IBM implementation to take advantage of the powerful new native APIs provided by ooRexx 4.0.0. ooDialog 4.2.3 is far more powerful, has many more features, and is more capable than the original ooDialog.

While every effort has been made to ensure that ooDialog 4.2.0 and later is entirely backwards compatible with the original IBM implementation, there are a few reports of some small number of existing ooDialog programs that have problems under ooDialog 4.2.3.

It is the intention of the development team that ooDialog 4.2.3 is backwards compatible with previous versions of ooDialog. If an ooDialog programmer or user discovers a case where this is not so, he or she should open up a bug report on SourceForge, or at the very least discuss the problem on the ooRexx Users list.

If the problem can be fixed, it will be. If it can not be fixed, the reason for that will be explained.

It is the intent that the version of ooDialog distributed with each new release of ooRexx be the current officially released version of ooDialog. If any ooDialog programmer or user is unhappy with the backwards compatibility of that version of ooDialog, and they do not find the new features of ooDialog compelling enough, they are advised to install one of the earlier versions of ooDialog available on SourceForge.

## 2. Windows Requirements, Installation and Configuration

### 2.1. Hardware Requirements

- Approximately 50 MB free disk space is needed for a complete installation.
- 8 MB free disk space for the core interpreter.
- 29 MB free disk space for online documentation.

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<sup>1</sup> <http://sourceforge.net/p/ooRexx/bugs/>

<sup>2</sup> <http://sourceforge.net/p/ooRexx/feature-requests/>

<sup>3</sup> <http://sourceforge.net/p/ooRexx/documentation/>

<sup>4</sup> <http://sourceforge.net/projects/ooRexx/files/ooDialog/>

- 14 MB free disk space for all samples.
- 25 MB free disk space for the API headers and libraries.
- Any hardware capable of running the supported Windows operating systems is sufficient.

## 2.2. Software Requirements

On Windows, the ooRexx development team is committed to supporting all active versions of Windows. That is, versions of Windows that Microsoft has not declared end of life. For ooRexx version 4.2.0, the officially supported version of Windows are Windows XP through Windows 8.1. The team will not *purposely* make changes to prevent ooRexx from running on versions of Windows that have reached end of life. However, the team is more interested in supporting newer versions of Windows than they are in supporting out of date operating systems. Versions of Windows that are no longer supported by Microsoft, are officially not supported by ooRexx.

The following lists the versions of Windows that ooRexx 4.2.0 has been consistently tested on by the development team:

- Windows XP
- Windows Vista
- Windows 7

The following lists the version of Windows where the development team has good anecdotal evidence that ooRexx 4.2.0 still works well on:

- Windows 2000
- Windows 2003

The following lists the version of Windows that the development team is committed to supporting. However, ooRexx 4.2.0 has not been well tested by the development team on these versions of Windows. Testing has been done by committed users of ooRexx.

- Windows 8
- Windows 8.1

## 2.3. Installation and Configuration Information

### 2.3.1. Pre-Installation Notes

Open Object Rexx cannot coexist with IBM Object REXX. If IBM Object REXX is installed on the system you must first uninstall it.

If a previous version of ooRexx is installed, you *should* uninstall it. If two different versions of ooRexx are installed on the same system, the results are not predictable and the interpreter will *not* work correctly. You could install over the top of the existing installation, but that is not recommended and is not supported.

A previous version of ooRexx can be uninstalled ([Section 2.3.3, “Windows Uninstall Information”](#)) before starting the new installation. However, the uninstall does not have to be done as a separate step. When the installation program is started it will detect a previous version of ooRexx and offer to uninstall it at that time.



## Warning

If a previous Windows install exists and is not the same addressing mode (32 or 64) as the version of ooRexx about to be installed, there are potential problems when the uninstaller is launched from the installer automatically. In this case it is **strongly** advised that the uninstallation program be run first to completely uninstall the current version of ooRexx, and then the new installer be run.

**rxapi** is an important part of ooRexx that runs as a daemon process. The installation program offers the option of installing **rxapi** as a Windows Service. Unless you are a knowledgeable user, with a good reason not to, you should elect to install **rxapi** as a Windows Service.

ooRexx should be installed by a user with administrator rights. On Vista and later this is a requirement. It is also a requirement in order to install rxapi as a service. In addition, there are several installation steps that can only be performed with administrator rights. They are:

1. The subdirectory that ooRexx is installed into is added to the System PATH environment variable.
2. The environment variable REXX\_HOME is set for all users.
3. The file type (ftype) **REXXScript** is defined for the interpreter executable and the file extension **.rex** is associated (assoc) with the **REXXScript** file type.
4. The file extension **.rex** is added to the System PATHEXT environment variable.
5. On Windows XP, and later, if the installation program is run without administrator rights, ooRexx can not be installed to its default location in **\Program Files\**.



## Note

On Vista when a user starts the installation program, the user is prompted for an administrator password to continue. It is not necessary to actually be logged in as administrator when the installation is started.

It is important that if ooRexx is installed by a user with administrator rights, that ooRexx is uninstalled by a user with administrator rights. Otherwise, the installation steps described above, including removal of rxapi as a service, will not be undone when ooRexx is uninstalled.

ooRexx is compiled both as 32-bit application and as a native 64-bit application. The native 64-bit application can not be installed on a 32-bit version of Windows. Either the 32-bit or the 64-bit ooRexx can be installed on a 64-bit version of Windows. However, to take full advantage of both the operating system and ooRexx, the user should install the 64-bit version of ooRexx on a 64-bit version of Windows. The installation programs for the two types of ooRexx are clearly labelled: **ooRexx-4.2.0.windows.x86\_32.exe** and **ooRexx-4.2.0.windows.x86\_64.exe**.

### 2.3.2. Running the Installation Program on Windows

Before starting the installation, review the pre-installation ([Section 2.3.1, "Pre-Installation Notes"](#)) notes if you have not already done so.

The ooRexx installation program is a typical Windows installation program. Download the installation program for your operating system. From Windows Explorer double-click the appropriate installation package: **ooRexx-4.2.0.windows.x86\_32.exe** or **ooRexx-4.2.0.windows.x86\_64.exe**. Follow the prompts in the installation dialog. Naturally, the program can also be run from a console window by typing the executable name at the command prompt.



### Note

If a previous version of ooRexx is installed and the rxapi daemon process is running, the user will be prompted to halt the process. The process *must* be halted to properly install the new version. If necessary, (because a Rexx program is running in the background and you are worried about possible data loss,) cancel the installation and take the appropriate steps to halt the process cleanly. If, on the other hand, you somehow trick the installation program to continue without halting the rxapi process, you will most likely end up with a corrupt installation of ooRexx.

**Unattended installation.** The Windows installation program can be run from the command line with no user input. This is done by using the **/S** option. Note that in this mode default values are used for all options other than the installation directory. This mode can be used to script automatic installs or multiple installs on different machines. From a script, or from the command line, enter the installation program name followed by the **/S** parameter, and the **/D** parameter if the default installation directory should be changed:

**/S** : Silent mode

This will install ooRexx without any user intervention using default values for all options.

**/D** : Default directory

The default installation directory, (C:\Program Files\ooRexx), can be changed using this switch. This must be the last parameter used in the command line and must not contain any quotes, even if the path contains spaces. For example:

```
ooRexx-4.2.0.windows.x86_64.exe /S /D=C:\Program Files\Interpreters\ooRexx
```

### 2.3.3. Windows Uninstall Information

In XP, from the Control Panel select "Add Remove Programs", then select "Open Object Rexx for Windows" and select "Remove". In later versions of Windows, select "Programs and Features" from the Control Panel and follow the same steps.

Alternatively, the ooRexx installation places a menu item in the program folder that can be used to uninstall. Select "Start->All Programs->Open Object Rexx->Uninstall ooRexx". This is functionally equivalent to using "Add Remove Programs".

## 2.4. Running Open Object Rexx as a Child Process of a Service on Windows

**rxapi** in its role as the memory manager for ooRexx can share out some resources among all the ooRexx processes to enable global functions, system exits, subcommand handlers, and global queues. If you start ooRexx from a service, two or more processes might run under different user

accounts. Therefore it is required that the memory manager is not protected and can be accessed by every user. This means that ooRexx global data is system global and unsecured.

Note that starting ooRexx from a service is different than installing **rxapi** as a service.

If you want ooRexx to be started from a service, ooRexx must be installed as a common program or you must modify the system path manually to include the directory where ooRexx has been installed.

If you are writing a service that calls `RexxStart()`, ensure that the `SERVICE_INTERACTIVE_PROCESS` flag is set for your service. To prevent access violations, use a NULL security descriptor and assign it to your service process.

## 2.5. Open Object Rexx and Other Rexx Interpreters

If you have other Rexx interpreters installed, you may have to set the PATH manually because ooRexx and the other Rexx interpreters may both use the name "rex" for invoking the interpreter. Interpreter error messages that begin with "Rex:" indicate that another Rexx interpreter was called instead of ooRexx. You can verify which Rexx interpreter is running either by the form of the error messages, by running **rextry.rex** and executing `SAY VERSION`, or by invoking **rex /V**, which then should display information about the Rexx interpreter that is invoked. If no information is displayed, it is not ooRexx. If you don't want the other Rexx interpreter to be invoked, you should remove it from the PATH, delete it, or rename **rex.exe** in the installation directory to **orx.exe** and use **orx** to invoke the interpreter.

## 2.6. Exploring Open Object Rexx

Once you have installed the ooRexx files you can run Rexx scripts by issuing the command **rex** followed by the name of your Rexx script at the command prompt. In addition, if you installed ooRexx as recommended, a file type has been associated with the **.rex** extension which allows you to just type the name of your script, without the extension, to run it. For example, if your program was named **addressBook.rex**, the file association will allow you to execute the program as follows:

```
C:\work.ooRexx>addressBook
```

An execution of the program might look like this:

```
C:\work.ooRexx>addressBook
ooRexx Address Lookup, version 1.1.0
  Look up address for: gatch

Tom Gatch
3245 Westfield Dr
Mission Bay CA 92110

  Look up another address? [y/n] n
C:\work.ooRexx>
```

To interactively try Object Rexx statements, enter **rex rextry.rex** on the command line. Enter **exit** to end the program.

To help you explore programming in Open Object Rexx, the following generic sample programs are provided:

`ccreply.rex`  
concurrent program using REPLY

`complex.rex`  
complex number class

`drives.rex`  
demonstrates the usage of Sys functions

`factor.rex`  
factorial program

`greply.rex`  
concurrent program using WAIT and NOWAIT

`guess.rex`  
a guessing game

`ktguard.rex`  
concurrent program using START and GUARD

`makestring.rex`  
demonstrated the usage of the makestring method

`month.rex`  
displays a calendar for the month of January

`philfork.rex`  
program that demonstrates Open Object Rexx concurrency

`pipe.rex`  
a pipeline implementation

`properties.rex`  
shows usage of the .Properties class and some Sys functions

`qdate.rex`  
date query program

`qtime.rex`  
time query program

`rexxcps.rex`  
measures Rexx performance

`scclient.rex` `scserver.rex`  
a client / server demonstration using the .Socket class from socket.cls

`semcls.rex`  
semaphore class

`sfclient.rex` `sfserver.rex`  
a client / server demonstration using the external rxsock library

`stack.rex`  
program that uses a stack class

usecomp.rex

program that uses the complex number class (see note below)

usepipe.rex

program that uses the pipeline implementation (see note below)



### Note

To run these programs, you must either add the **samples** directory to the PATH or execute them directly from the **samples** directory.

To help you explore using the Windows **WinSystem.cls**, the following sample programs are provided:

deskicon.rex

AddDesktopIcon method of the WindowsProgramManager class

desktop.rex

uses the WindowsProgramManager class

displayAnyMenu.rex

Displays the menu hierarchy for a window that the user picks. The example uses a mixture of ooDialog and WinSystem.

displayWindowTree.rex

Allows the user to pick an open top-level window and then displays the window hierarchy for that window. The program uses both ooDialog and WinSystem classes.

eventlog.rex

uses the WindowsEventLog class

getTheWindow.rex

This example shows how to find a window without using the exact window title.

menuCalc.rex

Uses the MenuObject class to display the menu hierarchy of the Windows Calculator application. The menu hierarchy for both the Calculator's standard view and its scientific view are printed to the console.

menuNotepad.rex

Uses the MenuObject class to displays the hierarchy of the Notepad menu.

quickCalc.rex

Demonstrates how to control an application programmatically using the winsystem classes. Does some simple calculations using the Windows Calculator application. This program is similar to usewmgr.rex but more simple to better show what is going on.

quickShowAllMenus.rex

Uses the windowsSystem.frm package to print out a menu outline of every open window that has a menu.

registry.rex

uses the WindowsRegistry class

`usewmgr.rex`

program that uses the `WindowsManager` class

`windowsSystem.frm`

A collection of public routines and classes to help work with the `winsystem.cls` package. This is an example of how to extract common function into a package, and then use the package to help in writing similar programs. A number of the sample programs that use `winsystem.cls` make use of this framework.

`writeWithNotepad.rex`

Uses classes in `winsystem.cls` to automate the Windows Notepad application. This is a subset of the `usewmgr.rex` program designed to be a little easier to understand.

The directory **`samples\ole\`** and its subdirectories contain a number of samples for the ooRexx OLE / ActiveX interface. The sample programs contain comments to help with learning to use the `OLEObject` class.

The **`samples\oodialog`** and its subdirectories contain a relatively large number of example programs that demonstrate the use of `OODialog`. A subset of these examples can be launched from the ooRexx Program folder in the Start Menu. "Start->All Programs->Open Object Rexx->ooRexx Samples->oodialog"

There are several examples provided to help with programming external function libraries using the ooRexx native API. These samples are located under the **`samples\api`** directory, along with two read me files:

- **`sample\api\readme.txt`**
- **`sample\api\callrxnt`**
- **`sample\api\callrxwn`**
- **`sample\api\rexexit`**
- **`sample\api\wpipe`**
- **`sample\api\wpipe\readme.txt`**

Several of the API samples can be launched from the ooRexx Program folder in the Start Menu. "Start->All Programs->Open Object Rexx->ooRexx Samples->API"

## 3. Unix-Like (AIX, Linux, etc.,) Requirements, Installation and Configuration

### 3.1. Hardware Requirements

- 12 MB free disk space for the program (20 MB for AIX)
- 13.5 MB free disk space for online documentation
- IBM-compatible, Pentium or AMD processor, or higher, for an x86 32-bit or 64-bit platform.
- Any system capable of running AIX 5L 5.2/5.3 or AIX 6.1 for an AIX platform.
- SPARC processor for a SUN Solaris (SPARC) platform.

## 3.2. Software Requirements

- **Linux**
  - Linux ELF system (i386 or x86\_64.) Linux kernel version 2.4.1 or higher, with support for System V IPC.
  - Linux PPC system. Linux kernel version 2.4.1 or higher, with support for System V IPC.
- **AIX**
  - AIX 5L 5.2 TL10 and up.
  - AIX 5L 5.3 TL7 and up.
  - AIX 6.1 TL1 and up.
- **Solaris**
  - Solaris V2.8 or higher.

## 3.3. Installation and Configuration Information

This new version of Open Object Rexx cannot coexist with a previous installed version of Open Object Rexx or IBM Object REXX on your system. If you have previously installed IBM Object Rexx or Open Object Rexx, you must first de-install that program.

### 3.3.1. Installation/Removal of the RPM Package



#### Note

The installation of Open Object Rexx requires that all steps be run with root authority.

To install the **rpm** package, use your rpm package manager. Refer to your package manager for further information. The package manager adds orexx to your local rpm-database. Select the appropriate package for your system. Although the 32-bit version of ooRexx can be installed on some 64-bit Linux distributions it is recommended that the 64-bit version of ooRexx be installed on all 64-bit Linux systems.

There may be several rpm packages available. Each package name will indicate the processor architecture (i386, x86\_64, ppc, etc.) it is intended for, and the Linux distribution it was built on. In general, the Linux distribution the package was compiled on does not make a difference. The ooRexx rpm will install on any Linux system that supports rpms. However, sometimes, because of the libraries present on a system, the ooRexx rpm will not install. For instance, the Fedora Core 10 rpm may not install on a SuSE 9.3 system. Because of this, when resources are available, the ooRexx project will make available rpm packages built for older Linux distributions.

To install with the command line rpm package manager, a typical command line might be:

```
rpm -i ooRexx-4.0.0-1.i386.fedora10.rpm
```

or

```
rpm -i ooRexx-4.0.0-1.x86_64.fedora10.rpm
```

Open Object Rexx is installed in the directory **/opt/ooRexx**. Links are created in **/usr/lib** and **/usr/bin** for the ooRexx shared libraries and executables respectively. Additional links are created in **/usr/include** for the native API header files.

Use the rpm package manager to remove ooRexx from the system. The command line **rpm** can also be used to remove the package from the system. The command to enter is:

```
rpm -e ooRexx
```

### 3.3.2. Installation/Removal of the DEB Package



#### Note

The installation of Open Object Rexx requires that all steps be run with root authority.

Debian based Linux distributions (Kubuntu, Ubuntu, etc.) use the debian package manager. If you use one of the ... refer to the documentation for that tool. On the other hand, ooRexx installs easily from the command line. Use the following command to install a **.deb** package from the command line:

```
dpkg -i <packageFile>
```

For example:

```
tom@Loon:~/downloads$ dpkg -i ooRexx-4.0.0-1.i386.kubuntu810.deb
```

Open Object Rexx is installed in the directory **/opt/ooRexx**.

The command **dpkg --purge** is used to remove ooRexx from the system. For example:

```
tom@Loon:/$ dpkg --purged ooRexx
```

Or, use the same package manager you used to install to remove ooRexx from a debian based system.

### 3.3.3. Detailed Installation/Removal Information for AIX

#### Installation location

This build is installed in **/opt/ooRexx**.

The following links are created from **/opt/ooRexx/bin** to **/usr/bin**:

```
/usr/bin/rexx
/usr/bin/rexx.img
/usr/bin/rxftp.cls
/usr/bin/rxregexp.cls
/usr/bin/socket.cls
/usr/bin/rxapi
/usr/bin/ooress-config
/usr/bin/rexxc
/usr/bin/rxqueue
/usr/bin/rxsubcom
/usr/bin/rexximage
```

### Required xIC.rte runtime level

xIC runtime 9.0.0.9 or higher

This runtime is contained in the April 2009 XL C/C++ Enterprise Edition V8.0 for AIX PTF. [IBM support](#)<sup>5</sup>

xIC runtime 10.1 or higher

This runtime is contained in the January 2009 IBM C++ Runtime Environment Components for AIX. [IBM support](#)<sup>6</sup>

### Installed services

The ooRexx 4.0.0.0 LPP will install the **rxapi** daemon. This package integrates seamlessly into the AIX SRC (System Resource Controller). The daemon is started automatically after the installation. The daemon will be started upon system boot via an entry in **/etc/inittab**.

### Comments

If you have any comments or questions please do not hesitate to ask. See the "Getting Help" sections in any of the reference manuals for places to ask questions. The AIX maintainer can be reached by posting questions to the Developer Mailing List (see the "Developer Mailing List" section in any of the reference manuals).

To install the **LPP** package, use smitty.

```
smitty
-> Software Installation and Maintenance
  -> Install and Update Software
    -> Install Software
```

To remove the **LPP** package, use smitty.

```
smitty
-> Software Installation and Maintenance
  -> Software Maintenance and Utilities
    -> Remove Installed Software
```

---

<sup>5</sup> [http://www-01.ibm.com/support/docview.wss?rs=2239&context=SSJT9L&dc=D400&uid=swg24022586&loc=en\\_US&cs=utf-8&lang=en](http://www-01.ibm.com/support/docview.wss?rs=2239&context=SSJT9L&dc=D400&uid=swg24022586&loc=en_US&cs=utf-8&lang=en)

<sup>6</sup> [http://www-01.ibm.com/support/docview.wss&rs=2239&context=SSJT9L&dc=D400&uid=swg24022049&loc=en\\_US&cs=utf-8&lang=en](http://www-01.ibm.com/support/docview.wss&rs=2239&context=SSJT9L&dc=D400&uid=swg24022049&loc=en_US&cs=utf-8&lang=en)

### 3.3.4. Installation of the TGZ Package



#### Note

The installation of Open Object Rexx requires that all steps be run with root authority.

If you have the package maintenance tool **pkgtool** on your system, you can use it to install or de-install Open Object Rexx via a graphical tool. Start pkgtool as root and install the **ooRexx-4.0.0-1.i386.tar.gz** or **ooRexx-4.0.0-1.x86\_64.tar.gz**, as appropriate, package. All files will be copied to the directory **/opt/ooRexx/**.

If **pkgtool** is not available, you can install Open Object Rexx by copying the **ooRexx-4.0.0-1.i386.tar.gz** (or **x86\_64**) file to the root directory (**/**) and decompress the package with the following command:

```
tar -zxvf ooRexx-4.0.0-1.i386.tar.gz
```

Then, you must manually execute the following commands, or cut and paste the following into a shell script and execute the script:

```
if [ -d /opt/ooRexx ]; then
ln -sf /opt/ooRexx/bin/rexx /usr/bin/rexx
ln -sf /opt/ooRexx/bin/rexxc /usr/bin/rexxc
ln -sf /opt/ooRexx/bin/rxapi /usr/bin/rxapi
ln -sf /opt/ooRexx/bin/rxqueue /usr/bin/rxqueue
ln -sf /opt/ooRexx/bin/rxsubcom /usr/bin/rxsubcom
ln -sf /opt/ooRexx/bin/rexx.img /usr/bin/rexx.img
ln -sf /opt/ooRexx/bin/rexx.cat /usr/bin/rexx.cat
ln -sf /opt/ooRexx/bin/rxregexp.cls /usr/bin/rxregexp.cls
ln -sf /opt/ooRexx/bin/rxftp.cls /usr/bin/rxftp.cls
ln -sf /opt/ooRexx/bin/socket.cls /usr/bin/socket.cls
ln -sf /opt/ooRexx/bin/ooRexx-config /usr/bin/ooRexx-config
ln -sf /opt/ooRexx/lib/ooRexx/librexx.so.4.0.0 /usr/lib/librexx.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librexx.so.4.0.0 /usr/lib/librexx.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librexx.so.4.0.0 /usr/lib/librexx.so
ln -sf /opt/ooRexx/lib/ooRexx/librexx.la /usr/lib/librexx.la
ln -sf /opt/ooRexx/lib/ooRexx/librexxapi.so.4.0.0 /usr/lib/librexxapi.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librexxapi.so.4.0.0 /usr/lib/librexxapi.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librexxapi.so.4.0.0 /usr/lib/librexxapi.so
ln -sf /opt/ooRexx/lib/ooRexx/librexxapi.la /usr/lib/librexxapi.la
ln -sf /opt/ooRexx/lib/ooRexx/librxsock.so.4.0.0 /usr/lib/librxsock.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librxsock.so.4.0.0 /usr/lib/librxsock.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librxsock.so.4.0.0 /usr/lib/librxsock.so
ln -sf /opt/ooRexx/lib/ooRexx/librxsock.la /usr/lib/librxsock.la
ln -sf /opt/ooRexx/lib/ooRexx/librxmath.so.4.0.0 /usr/lib/librxmath.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librxmath.so.4.0.0 /usr/lib/librxmath.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librxmath.so.4.0.0 /usr/lib/librxmath.so
ln -sf /opt/ooRexx/lib/ooRexx/librxmath.la /usr/lib/librxmath.la
ln -sf /opt/ooRexx/lib/ooRexx/librxregexp.so.4.0.0 /usr/lib/librxregexp.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librxregexp.so.4.0.0 /usr/lib/librxregexp.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librxregexp.so.4.0.0 /usr/lib/librxregexp.so
ln -sf /opt/ooRexx/lib/ooRexx/librxregexp.la /usr/lib/librxregexp.la
ln -sf /opt/ooRexx/lib/ooRexx/librexxutil.so.4.0.0 /usr/lib/librexxutil.so.4.0.0
ln -sf /opt/ooRexx/lib/ooRexx/librexxutil.so.4.0.0 /usr/lib/librexxutil.so.4
ln -sf /opt/ooRexx/lib/ooRexx/librexxutil.so.4.0.0 /usr/lib/librexxutil.so
```

```

ln -sf /opt/ooRexx/lib/ooRexx/librexxutil.la /usr/lib/librexxutil.la
ln -sf /opt/ooRexx/include/rexx.h /usr/include/rexx.h
ln -sf /opt/ooRexx/include/rexxapidefs.h /usr/include/rexxapidefs.h
ln -sf /opt/ooRexx/include/rexxapitypes.h /usr/include/rexxapitypes.h
ln -sf /opt/ooRexx/include/rexxplatformapis.h /usr/include/rexxplatformapis.h
ln -sf /opt/ooRexx/include/rexxplatformdefs.h /usr/include/rexxplatformdefs.h
ln -sf /opt/ooRexx/include/ooREXXapi.h /usr/include/ooREXXapi.h
ln -sf /opt/ooRexx/include/ooREXXerrors.h /usr/include/ooREXXerrors.h
ln -sf /opt/ooRexx/share/man/man1/ooREXX-config.1 /usr/share/man/man1/ooREXX-
config.1
ln -sf /opt/ooRexx/share/man/man1/rexx.1 /usr/share/man/man1/rexx.1
ln -sf /opt/ooRexx/share/man/man1/rexxc.1 /usr/share/man/man1/rexxc.1
ln -sf /opt/ooRexx/share/man/man1/rxsubcom.1 /usr/share/man/man1/rxsubcom.1
ln -sf /opt/ooRexx/share/man/man1/rxqueue.1 /usr/share/man/man1/rxqueue.1
ln -sf /opt/ooRexx/share/ooRexx/rexxtry.rex /usr/bin/rexxtry.rex
# allow backwards compatibility to Object REXX 2.x
ln -sf /opt/ooRexx/lib/ooRexx/librexxapi.so.4.0.0 /usr/lib/librexxapi.so.2
fi
if [ -d /etc/rc.d/init.d ]; then
# Red Hat
cp /opt/ooRexx/bin/rxapid /etc/rc.d/init.d
ln -sf /etc/rc.d/init.d/rxapid /etc/rc.d/rc3.d/S89rxapid
ln -sf /etc/rc.d/init.d/rxapid /etc/rc.d/rc5.d/S89rxapid
ldconfig
/etc/rc.d/init.d/rxapid start
else
# Suse
cp /opt/ooRexx/bin/rxapid /etc/rc.d
ln -sf /etc/rc.d/rxapid /etc/rc.d/rc3.d/S89rxapid
ln -sf /etc/rc.d/rxapid /etc/rc.d/rc5.d/S89rxapid
ldconfig
/etc/rc.d/rxapid start
fi

```

To remove ooRexx after installing using the tar file, just reverse the process. Manually execute, or cut and paste into a shell script the following commands:

```

rm -f /usr/bin/rexx
rm -f /usr/bin/rexxc
rm -f /usr/bin/rxapi
rm -f /usr/bin/rxqueue
rm -f /usr/bin/rxsubcom
rm -f /usr/bin/rexx.img
rm -f /usr/bin/rexx.cat
rm -f /usr/bin/rxregexp.cls
rm -f /usr/bin/rxftp.cls
rm -f /usr/bin/socket.cls
rm -f /usr/bin/ooREXX-config
rm -f /usr/lib/librexx.so
rm -f /usr/lib/librexx.4.0.0
rm -f /usr/lib/librexx.4
rm -f /usr/lib/librexxapi.so
rm -f /usr/lib/librexxapi.4.0.0
rm -f /usr/lib/librexxapi.4
rm -f /usr/lib/librxsock.so
rm -f /usr/lib/librxsock.4.0.0
rm -f /usr/lib/librxsock.4
rm -f /usr/lib/librxmath.so
rm -f /usr/lib/librxmath.4.0.0
rm -f /usr/lib/librxmath.4
rm -f /usr/lib/librxregexp.so
rm -f /usr/lib/librxregexp.4.0.0
rm -f /usr/lib/librxregexp.4

```

```

rm -f /usr/lib/librexxutil.so
rm -f /usr/lib/librexxutil.4.0.0
rm -f /usr/lib/librexxutil.4
rm -f /usr/share/man/man1/ooREXX-config.1
rm -f /usr/share/man/man1/rexx.1
rm -f /usr/share/man/man1/rexxc.1
rm -f /usr/share/man/man1/rxsubcom.1
rm -f /usr/share/man/man1/rxqueue.1
rm -f /usr/include/rexx.h
rm -f /usr/include/rexxapidefs.h
rm -f /usr/include/rexxapitypes.h
rm -f /usr/include/rexxplatformapis.h
rm -f /usr/include/rexxplatformdefs.h
rm -f /usr/include/ooREXXapi.h
rm -f /usr/include/ooREXXerrors.h
rm -f /usr/bin/rexxtry.rex
rm -rf /usr/share/ooREXX
if [ -d /etc/rc.d/init.d ]; then
    # Red Hat
    /etc/rc.d/init.d/rxapid stop
    rm /etc/rc.d/rc3.d/S89rxapid
    rm /etc/rc.d/rc5.d/S89rxapid
    rm /etc/rc.d/init.d/rxapid
else
    # Suse
    /etc/rc.d//rxapid stop
    rm /etc/rc.d/rc3.d/S89rxapid
    rm /etc/rc.d/rc5.d/S89rxapid
    rm /etc/rc.d/rxapid
fi
ldconfig
# Do not change this to rm -rf /opt/ooREXX
# If you do you could wipe out the all the /usr subdirs!
if [ -d /opt/ooREXX ]; then
    rm -rf /opt/ooREXX
fi

```

Then delete the ooREXX directory in **/opt**. Be careful you delete what you mean to delete:

```

cd /opt
# Check that the ooREXX directory is there:
ls ooREXX
# If the ooREXX directory is there:
rm -rf ooREXX/

```

### 3.3.5. Installation/Removal of the PKG Package



#### Note

The installation of Open Object Rexx requires that all steps be run with root authority.

To install the **pkg** package, use your package-manager. Select the appropriate package for the installation. Refer to your package manager for further information. The package manager adds orexx to your local pkg-database. The basic command for the command line package-manager is:

```
pkgadd -d <packageName>
```

Open Object Rexx is installed in the directory **/opt/ooRexx**.

The command **pkgrm** can also be used to remove the package from the database if it is entered at the command line:

```
pkgrm ooRexx
```

### 3.4. Configuration

There is nothing to configure for a Unix/Linux installation.

### 3.5. Open Object Rexx and Other Rexx Interpreters

If you have other Rexx interpreters installed, you may have to set the PATH manually because Open Object Rexx and the other Rexx interpreters may both use the name "rex" for invoking the interpreter. Interpreter error messages that begin with "Rex: " indicate that another Rexx interpreter was called instead of Open Object Rexx. You can verify which Rexx interpreter is running either by the form of the error messages, by running **rextry** and executing SAY VERSION, or by invoking **rex -v**, which then should display information about the Rexx interpreter that is invoked. If no information is displayed, it is not Open Object Rexx. If you don't want the other Rexx interpreter to be invoked, you should remove it from the PATH, delete it, or rename the **rex** binary in the **/usr/bin** directory to **orx** and use **orx** to invoke the interpreter.

### 3.6. Exploring Open Object Rexx for Unix/Linux

Once you have installed the Open Object Rexx files you can run Rexx scripts by issuing the command **rex** followed by the name of your script at the command prompt. To interactively try Rexx statements, from a command prompt type **rex rextry**. Enter **exit** to end the program.

To help you explore programming in Open Object Rexx, the following sample programs are provided in the **/opt/ooRexx/share/ooRexx**:

```
ccreply.rex
    concurrent program using REPLY

complex.rex
    complex number class

factor.rex
    factorial program

greply.rex
    concurrent program using WAIT and NOWAIT

guess.rex
    a guessing game
```

ktguard.rex

concurrent program using START and GUARD

makestring.rex

demonstrated the usage of the makestring method

month.rex

displays a calendar for the month of January

pipe.rex

a pipeline implementation

properties.rex

shows usage of the .Properties class and some Sys functions

qdate.rex

date query program

qtime.rex

time query program

rexxcps.rex

measures Rexx clauses per second

rexxtry.rex

interactively try out Rexx statements

scclient.rex scserver.rex

a client / server demonstration using the .Socket class from socket.cls

semcls.rex

implements a semaphore class on ooRexx

sfclient.rex sfserver.rex

a client / server demonstration using the external rxsock library

stack.rex

program that uses a stack class

usecomp.rex

program that uses the complex number class

usepipe.rex

program that uses the pipeline implementation



### Note

To run these programs, you must either add the **/opt/ooRexx/share/ooRexx** directory to the PATH or execute them directly from the **/opt/ooRexx/share/ooRexx** directory.

## 4. The rxapi Daemon Process

Part of ooRexx is **rxapi** which is a daemon process that manages all data that can persist across interpreter invocations or is used for cross-process communications. The **rxapi** process manages the Rexx data queues, the macrospace, and all of the external function, subcommand handler and exit registrations.

In ooRexx 4.0.0, and later versions, the interpreter and **rxapi** communicate through a socket interface, rather than through shared memory as in versions of ooRexx prior to 4.0.0.

Ideally, **rxapi** should run as a service. When you install ooRexx from a package on Linux, **rxapi** will be set up to run as a system service. When installing the Windows package, the default is to install **rxapi** as a Windows service. In this scenario, the operating system will start the **rxapi** daemon on boot up and shut the daemon down when the system is halted.

If **rxapi** is not installed as a service, the first time the interpreter executes, and needs the function provided by **rxapi**, the interpreter will start the daemon process. Once started, the **rxapi** process will continue to run until the system is halted.

There is little or no point in stopping the **rxapi** process once it is started. **Be aware** that if you do stop the **rxapi** process, all queues, all registered subcommand handlers, system exits, and external functions, and the macrospace, disappear.

When **rxapi** is installed as a service, it can be started and stopped by the user, if the user has the proper authority, in the same manner as other services. On Windows, the services manager can be used to start or stop **rxapi**. Or, from the command line, net stop or net start can also be used:

```
C:\work.ooRexx>net stop rxapi
The RXAPI service is stopping.
The RXAPI service was stopped successfully.

C:\work.ooRexx>net start rxapi

The RXAPI service was started successfully.

C:\work.ooRexx>
```

On Linux, the following can be used from the command line:

```
[root@Falcon work.ooRexx]# /etc/init.d/rxapid stop
Stopping rxapi: [ OK ]
[root@Falcon work.ooRexx]# /etc/init.d/rxapid start
Starting rxapi: [ OK ]
[root@Falcon work.ooRexx]#
```

It is likely that your installation of Linux also has a graphical means of starting or stopping services.

On AIX, the following can be used from the command line:

```
[root@myhost]# stopsrc -s rxapi
0513-044 The rxapi Subsystem was requested to stop.
[root@myhost]# startsrc -s rxapi
0513-059 The rxapi Subsystem has been started. Subsystem PID is 1134614.
[root@myhost]# lssrc -s rxapi
Subsystem      Group          PID           Status
rxapi          rxapi          1134614       active
[root@Falcon work.ooRexx]#
```

If **rxapi** is not installed as a service, it can be stopped by using an appropriate process killer for your platform. Typically the Task Manager on Windows and **kill** on a unix-like system.

## 5. Known Limitations, Problems and Workarounds

- The global directory .environment is process local, not global to the system.
- Under Unix/Linux only piped "|" input and redirected output(">") can be evaluated by Open Object Rexx. Redirected input("<") can not be evaluated.

## 6. Documentation

All documentation is contained in PDF files and zipped HTML package files and is available online at SourceForge in the files section for documentation for the version of the interpreter in use. For the 4.2.0 release the documentation is at: [ooRexx 4.2.0 Documentation](https://sourceforge.net/projects/ooRexx/files/ooRexx-docs/4.2.0/)<sup>7</sup>

The following documents are available:

rexxref.pdf

This is the *Open Object Rexx: Reference*.

rexxpg.pdf

This is the *Open Object Rexx: Programming Guide*.

oodialog.pdf

This is the *ooRexx Documentation: ooDialog Reference 4.2.3*.

oodguide

This is the *ooRexx Documentation: ooDialog User Guide 4.2.3*.

rxsock.pdf

This is the *Open Object Rexx: TCP/IP Socket Library Functions Reference*.

rxftp.pdf

This is the *Open Object Rexx: FTP Class Library Reference*.

rxmath.pdf

This is the *Open Object Rexx: Mathematical Functions Reference*.

winextensions.pdf

This is the *Open Object Rexx: Windows Extensions Reference*.

unixextensions.pdf

This is the *Open Object Rexx: Unix Extensions Function Reference*.

<sup>7</sup> <https://sourceforge.net/projects/ooRexx/files/ooRexx-docs/4.2.0/>

readme.pdf

This document itself. The document is in PDF and HTML format.

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## B.7. General

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