

# MOMAP

## Installation Guide

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Version 2022A

# MOMAP

*Molecular Material Property Prediction Package*

# Version 2022A

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## MOMAP Installation Guide

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# Chapter 1. Installation

## Introduction

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Here we will describe how to install MOMAP 2022A Package.

We assume that you have the basic knowledge on how to install programs and manage your operating system. If this is not the case, please consult your local system administrator or consult HZW Co. Ltd for support.

## Installing MOMAP – Basic Procedure

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Installing MOMAP and configuring the license can be done in a few steps, that is,

1. Install MOMAP package
2. Obtain and install MOMAP license

## Installing MOMAP – In Details

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MOMAP is mainly targeted to be running in a UNIX-like environment, however, it can also be used on Windows or MacOS environment.

## Install MOMAP

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First download the MOMAP package from website:

<http://www.momap.net.cn/index.php/download>, by simply clicking the related link or DOWNLOAD button to download the file.

### a) Install MOMAP for Linux

The MOMAP package for **Linux** is downloaded as a single zipped installable run file, e.g.,

```
momap-2022A-linux-el7-mpich2.run.gz
```

Unzip the file and add executable attribute to the file, and install MOMAP by running:

```
$ gunzip momap-2022A-linux-el7-mpich2.run.gz
$ chmod a+x momap-2022A-linux-el-mpich2.run
$ ./momap-2022A-linux-el7-mpich2.run
```

Or more generally, install MOMAP by running:

```
$ sh momap-2022A-linux-el7-mpich2.run
```

The default installation folder is `$HOME/MOMAP-2022A`, however, one can change the target installation folder in the installation process.

Before using MOMAP, one should first set up the running environment by adding the following line to `~/.bashrc` if Bash is used:

```
. <installed_momap_folder>/env.sh
```

Log out and log back in again for it to take effect, then we can proceed to run MOMAP.

If the `Environment Modules` is installed, one can use the command `module` to manage the MOMAP running environment. Suppose the `Environment Modules` is installed to `/opt/Modules`, and the module files are put under `/opt/Modules/modulefiles`, one can create a directory, e.g., `momap`:

```
$ mkdir -p /opt/Modules/modulefiles/momap
```

Then, copy `<installed_momap_folder>/modulefile/2022A-mpich2` to that newly created directory.

However, if the user doesn't have the right to put the module file in the global `modulefiles` directory, one can do it in one's own `$HOME` directory, similarly, one first creates a directory, e.g., `momap`:

```
$ mkdir -p ~/.modulefiles/momap
```

Copy the `<installed_momap_folder>/modulefile/2022A-mpich2` to the newly created directory. Next, make it available to `Environment Modules` by using the following command:

```
$ module use ~/.modulefiles
```

Now one can use the module files as usual. For example, we can load the MOMAP environment by simply running the command:

```
| $ module load momap/2022A-mpich2
```

More information on how to use the Environment Modules, please refer to the website at <http://modules.sourceforge.net/>.

In some supercomputing centers, the SSH port may not be the default 22, in that case, we need to setup the SSH environment variable, for example:

```
| export MOMAP_SSH_PORT=5577
```

As to the specific port used, please contact the supercomputing center's system administrator for information.

If MOMAP is to be run under the **Ubuntu** Linux system, before we start to install MOMAP, we need first to promote the user rights and make the user to be an administrator. Here, we will show you how to make a user an administrator in Ubuntu through the command line:

```
| $ sudo usermod -aG sudo sampleuser
```

You can verify that the user is now in the “sudo” group by checking the groups a user belongs to, through the following command:

```
| $ groups sampleuser
```

Log out and log back in again for it to take effect, then we can proceed to have a normal MOMAP installation.

In addition, more environment variables can be added to one's `~/.bashrc` as described in the User Guide.

If you encounter the messages like the following:

```
| [/home/.../MOMAP-2022A] >>>
Install MOMAP to /home/qkli/MOMAP-2022A...
./install.sh: 109: source: not found
/home/qkli/MOMAP-2022A/bin/get_LicenseNumber.exe: error while loading
shared libraries: libILasMatInterface.so: cannot open shared object
file: No such file or directory
```

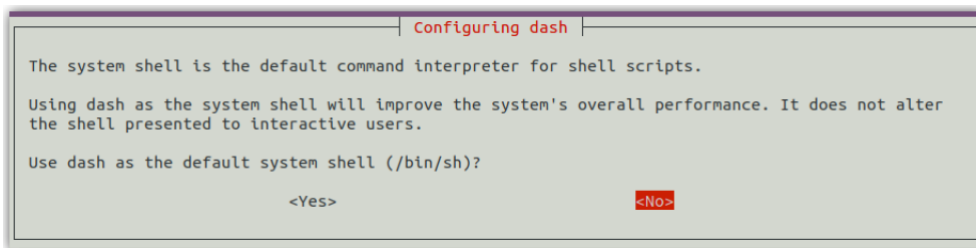
Then, run the command:

```
$ ls -l /bin/sh
... /bin/sh -> dash
```

It shows that `/bin/sh` is linked to `dash`, run the following command:

```
$ sudo dpkg-reconfigure dash
```

And select “No” as follows:



Finally, run the MOMAP installation file again.

## b) Install MOMAP for macOS

For the **macOS** case, the installation process is similar to that in the Linux case, however, we need to install the necessary libraries used in the MOMAP package, and here the **Homebrew** package manager for macOS is used. The installation procedure is as follows:

1. Install **Homebrew** if not installed already

```
$ /usr/bin/ruby -e "$(curl -fsSL
https://raw.githubusercontent.com/Homebrew/install/master
/install)"
```

2. Install GCC 11, Open-mpi, FFTW3 and Lapack 3.10

```
$ brew install gcc@11
$ brew install open-mpi
$ brew install fftw
$ brew install lapack
```

Other settings are similar to those in the Linux situation. Once the above installations are finished, we can use the MOMAP for macOS as in the Linux’s case.

### c) Install MOMAP for Windows

To install MOMAP for Windows, we need first to install MSYS2 as detailed below.

Download **MSYS2** at the link: <https://www.msys2.org>, and install MSYS2 to location `C:\msys64`.

Once the installation finishes, launch MSYS2. We need to install Python and MSMPI.

First, update the package database and core system package with:

```
$ pacman -Syu
```

Press ENTER to proceed the installation.

Now we use pacman to install Python and vim *etc.*:

```
$ pacman -S python
$ pacman -S vim
$ pacman -S openssh
```

Download **MSMPI** at the link: <https://docs.microsoft.com/en-us/message-passing-interface/microsoft-mpi>, and install to `C:\msys64\msmpi`.

Once the above MOMAP running environment settings are done, we can continue to install the **MOMAP for Windows**. For example, put the downloaded file to `D:\`, and extract the archived files to the directory `D:\MOMAP-2022A`. Check the file `env-mingw.sh` to see if the environment variable `MOMAP_ROOT` points to the installed directory.

Edit `~/ .bashrc` and add the following line:

```
./d/MOMAP-2022A/env-mingw.sh
```

If Gaussian `g16` is used as the QC program and installed to directory `C:\g16w`, we need also add the path to the environment variable `PATH` as follows:

```
export PATH = $PATH:/c/g16w
export GAUSS_EXEDIR = /c/g16w
```

The users may add other necessary settings to `~/ .bashrc` as needed.

Exit and reopen Bash terminal, then we can use MOMAP now.

For example, we would like to do some tests, first go to the directory `D:/MOMAP-`



2022A/tests:

```
█ $ cd /d/MOMAP-2022A/
```

Then we do the various test runs as we do in the Linux situation.

## Chapter 2. Licensing

### Generate MOMAP license data

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Before we can use MOMAP package, we need a license. There exist four license options, that is, Trial PC version, All-in-one PC version, Intranet cluster version and Super HPC cluster version.

- **Trial PC version:** Choose this option if you'd like to try the software with a desktop/laptop PC.
- **All-in-one PC version:** Choose this option if you plan to use the software in a workstation.
- **Intranet cluster version:** Choose this option if you plan to use the software in a small group-wise intranet computing cluster.
- **Super HPC cluster version:** Choose this option if you plan to use the software in the public domain super HPC cluster.

The program to collect the license data is `get_LicenseNumber.exe`, the program is called automatically at the end of MOMAP installation.

For the MOMAP for Windows case, we need to run `get_LicenseNumber.exe`, that is,

```
└─$ $MOMAP_ROOT/bin/get_LicenseNumber.exe
```

The generated license data file is located at directory `$MOMAP_ROOT/license/`, named as `LicenseNumber.txt`. One should send this file to HZW Co. Ltd.

Later on, a MOMAP license file, `hzwtech.lic`, will be sent to you by a sales representative from HZW Co. Ltd., you can simply copy the license file to `$MOMAP_ROOT/license` directory.

## Testing the installation

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To verify that the MOMAP package has been properly installed, and the license is correctly configured and installed, users can run a short test to verify the installation.

## Troubleshooting installation problems

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If you encounter any problems during the installation, please contact the HZW Co. Ltd. for support.