Lattice Diamond 3.14 Installation Guide for Linux

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Type Conventions Used in This Document

Convention	Meaning or Use
Bold	Items in the user interface that you select or click. Text that you type into the user interface.
<*Italic*>	Variables in commands, code syntax, and path names.
Ctrl+L	Press the two keys at the same time.
`Courier`	Code examples. Messages, reports, and prompts from the software.
`...`	Omitted material in a line of code.
`.` `.` `.`	Omitted lines in code and report examples.
`[ ]`	Optional items in syntax descriptions. In bus specifications, the brackets are required.
`( )`	Grouped items in syntax descriptions.
`{ }`	Repeatable items in syntax descriptions.
`|`	A choice between items in syntax descriptions.

Contents

Installing Diamond Tools

This document provides installation instructions for the Lattice Diamond® Linux software.

Diamond supports ASC, ECP5U, ECP5UM™, ECP5UM5G™, LatticeEC™, LatticeECP™, LatticeECP2™, LatticeECP2M™, LatticeECP2S™, LatticeECP2MS™, LatticeECP3™, LatticeSC™, LatticeSCM™, LatticeXP™, LatticeXP2™, LIFMD (CrossLink™), LIFMDF (CrossLinkPlus™), LFMNX (Mach-NX™), MachXO™, MachXO2™, MachXO3D™, MachXO3L™, MachXO3LF™, Platform Manager™, and Platform Manager 2 designs.

Note

The available devices vary depending on the type of license.

System Requirements

The following are the basic system requirements for Lattice Diamond on Linux:

- Intel Pentium or Pentium-compatible PC, or AMD Opteron system support:

  For Diamond Programmer:

  - The Lattice Diamond 64-bit release contains a 64-bit driver to support the 64-bit system.
- Red Hat Enterprise Linux version 7.9 or 8.8 operating system.

  The host operating system can only be 64-bit.
- Ubuntu version 20.04 or 22.04 LTS operating system.
  - The Lattice Diamond software has 64-bit specific application programs to run on Red Hat 64 platforms.

- The Lattice Diamond software is available in 64-bit versions. The 64-bit version of Lattice Diamond can only be installed on 64-bit systems.

- Approximately 10 GB free disk space
- Network adapter and network connectivity

Note

A floating license requires access to the license server, so both a network adapter and connectivity are required.

- 1024 x 768 graphics display
- JavaScript-capable Web browser
- Adobe Acrobat Reader, or equivalent PDF reader

Memory Requirements

Table 1 lists the minimum memory requirements and recommended memory for all the Lattice Semiconductor FPGA families.

Table 1: Recommended Memory for Linux

Device	Size	64-Bit Operating Systems	
		Minimum	Recommended
ECP5U/UM/UM5G	All	4 GB	6 GB
LatticeEC, LatticeECP	Up to 20K LUT	1 GB	1.5 GB
	Up to 50K LUT	1.5 GB	2 GB
LatticeECP2/M	Up to 20K LUT	1.5 GB	2 GB
	Up to 50K LUT	2 GB	3 GB
	Up to 100K LUT	2 GB	4 GB
LatticeECP3	Up to 95K LUT	4 GB	6 GB
	Up to 150K LUT	6 GB	8 GB
LatticeSC/M	Up to 40K LUT	1.5 GB	2 GB
	Up to 115K LUT	2 GB	5 GB
LatticeXP, LatticeXP2	Up to 20K LUT	1 GB	1.5 GB
	Up to 50K LUT	1.5 GB	2 GB
LIFMD (CrossLink), LIFMDF (CrossLinkPlus)	All	512 MB	1 GB

Table 1: Recommended Memory for Linux (Continued)

Device	Size	64-Bit Operating Systems	
		Minimum	Recommended
MachXO, MachXO2, MachXO3D, MachXO3L, MachXO3LF,Mach-NX	All	512 MB	1 GB
Platform Manager, Platform Manager 2	All	512 MB	1 GB

Technical Support

FAQs

The Answer Database provides solutions to questions that many of our customers have already asked. Lattice Applications Engineers are continuously adding to the database.

To access the Answer Database, go to www.latticesemi.com > Support > Answer Database.

For Technical Support Assistance

Submit a technical support case via technical support case portal or go to www.latticesemi.com > Support > Technical Support Request.

For Local Support

Contact your nearest Lattice Sales Office.

Installer Contents

The Lattice Diamond software installation packages are available for download from http://www.latticesemi.com/latticediamond. Click the **Downloads** tab. Some documents and downloads are not visible to anonymous visitors. To view all items, please log in to your Lattice account. Follow the product download instructions and uncompress the software.

The following describes the contents of the Lattice Diamond installer.

- The Lattice Diamond, Reveal, Programmer, and Power Estimator Linux installer run files have the following convention for 64-bit platforms.
  - [*version*]_[*product*]_lin.run - 64-bit platform
- The Lattice Diamond, Reveal, Programmer, and Power Estimator run file names are as follows:
  - 3.14.0.75.2_Diamond_lin.run
  - 3.14.0.75.2_Diamond_PowerEstimator_lin.run

- 3.14.0.75.2_Diamond_Programmer_lin.run
- 3.14.0.75.2_Diamond_Reveal_lin.run

- The Lattice Diamond “base” installation file (.run) installs Lattice Diamond and Synplify Pro for Lattice. See “Diamond 3.14 Release System Library Dependencies” on page 11 for more information.
- The Reveal installation file (.run) installs the stand-alone Reveal Analyzer. It is not necessary to install this package if the Diamond Base RUN is installed. See “Installing Stand-Alone Reveal Analyzer” on page 12 for more information.
- The Programmer installation file (.run) installs the stand-alone Diamond Programmer. It is not necessary to install this package if the Diamond Base RUN is installed. See “Installing Stand-Alone Programmer” on page 13 for more information.
- The Power Estimator (.run) file installs the stand-alone Diamond Power Estimator. It is not necessary to install this package if the Diamond Base RUN is installed. See “Installing Stand-Alone Power Estimator” on page 14 for more information.
- The LatticeMico installation file (.run) installs LatticeMico Development Tools and GNU-based Compiler Tools. See “Installing LatticeMico Development Tools” on page 31 for more information.
- The Installation Notice contains installation and licensing information.

Diamond Installed Directory Structure

Table 2 shows the Lattice Diamond software directory structure after installation:

Table 2: The Diamond Software Directory Structure

File or Directory	Description
bin/lin64/	This directory contains files for running the Lattice Diamond 64-bit GUI.
cae_library/	This directory contains synthesis header libraries for Synplify Pro in both Verilog and VHDL formats. It also contains the libraries for interface kits (ispLSI® design and simulation libraries).
data/	This directory contains files for the Lattice Diamond software.
docs/	This directory contains Lattice Diamond documentation, including manuals, tutorials, and the online Help.
embedded_source/	This directory contains source code files for the JTAG Full VME, JTAG Slim VME, Slave SPI, I2C, and sysCONFIG embedded systems for Lattice FPGA devices.
examples/	This directory contains Lattice design examples.
ispfpga/	This directory contains files for the Lattice Diamond software.

Table 2: The Diamond Software Directory Structure (Continued)

File or Directory	Description
license/	This directory contains the license agreement.
module/	This directory contains Lattice module files.
questasim/	This directory contains files for the QuestaSim for the Lattice Diamond software.
synpbase/	This directory contains files for the Synplify Pro for Lattice software.
tcltk/	This directory contains tcl/tk related files.

Installing Lattice Diamond on 64-Bit Platforms

Before installing the Lattice Diamond software, download the installation files from the Lattice Semiconductor Web site. For more information on how to download the Diamond software, go to http://www.latticesemi.com/latticediamond. Click the **Downloads** tab. Some documents and downloads are not visible to anonymous visitors. To view all items, please log in to your Lattice account. Follow the product download instructions and uncompress the software.

Note

Platform Manager 2 devices require the Diamond Platform Designer tool. The LatticeMico Development Tools must be installed along with Diamond in order to use Platform Designer, Refer to “Installing LatticeMico Development Tools” on page 31.

The RUN file has a companion MD5 checksum file. The MD5 file permits you to validate the integrity of the RUN file.

Note

- In the Diamond installation, blank space characters are not allowed in the installation directory path name.

Lattice Diamond for 64-bit systems is installed with the **3.14.0.71.0_Diamond_lin.run** installation file. The file installs all Lattice Semiconductor FPGA devices on your 64-bit system. It also installs the Synplify Pro for Lattice software. The following section guides you through the installation procedure step by step.

To install the Diamond software on 64-bit systems:

1. Go to Diamond software installers directory and execute the Diamond run file. Make sure the companion MD5 file is located in the same directory as the RUN file.

```
% cd <directory_with_RUN>
% ./3.14.0.75.2_Diamond_lin.run
```

2. Install the Diamond software. The default installation directory for Diamond is $HOME/lscc/diamond. You have the option of changing the installation directory.
   - To install to the default location ($HOME/lscc/diamond/3.14):

```
% cd <directory_with_RUN>
% ./3.14.0.75.2_Diamond_lin.run
```

Diamond 3.14 Release System Library Dependencies

The Diamond RUN package depends on a set of packages that provide 64-bit system libraries. Some of these packages may depend on lower level packages, the indirect dependencies. To fulfill this dependency, these packages must be installed before Diamond 3.14 can be installed. Check which ones are already present on your system by entering the command `rpm -qa | grep <package name>` and confirming that the named package appears in the results.

You can type the following command to determine the required libraries.

```
% ./bin/lin64/check_systemlibrary_diamond.csh
```

The following packages are the packages diamond_3_13-base-56-2-x86_64-linux.run depends on. This list does not include packages that are included with Diamond 3.14. Indirect dependencies are listed with indented levels.

- glibc
  - nss-softokn-freebl
- libjpeg
- libtiff
  - zlib
- glib2
  - libselinux
  - gamin
- libusb
- freetype
- fontconfig
  - expat
- libX11
  - libxcb
    - libXau
- libICE
  - libSM
- libuuid

- libXt
- libXext
- libXrender
- libXi
- libXft
- gstreamer1
- cdparanoia-libs
- opus
- libtheora
- iso-codes
- libvisual
- libglvnd-glx
- libglvnd
- gstreamer1-plugins-base

Installing the packages one by one requires the parent package to be installed last. The package deepest in the tree must be installed first. For example, libICE package depends on libSM. The libSM package must be installed prior to libICE.

Two cyclic dependencies are found with Diamond, glibc and nss-softokn-freebl, and glib2 and gamin. Installing these packages requires the two RPM's to be specified on the same rpm command line.

Note

User needs to make sure libusb-0.1.so.4 and libXss.so.1 are installed in Red Hat 7.4, and they are default installed in Red Hat 6.9 or earlier.

Installing Diamond Tools

This section describes how to install Diamond software tools including Stand-Alone Reveal Analyzer and Stand-Alone Programmer..

Installing Stand-Alone Reveal Analyzer

Reveal Analyzer is included in the Diamond installation. If you want to use the tool without installing Lattice Diamond, use one of the following files to install the stand-alone Reveal Analyzer:

- 3.14.0.75.2_Diamond_Reveal_lin.run for 64-bit systems.

To install the stand-alone Reveal Analyzer:

1. Close all applications before starting installation
2. Go to Radiant software installers directory and execute the Radiant Reveal run file.

```
% cd <directory_with_RUN>
% ./3.14.0.75.2_Diamond_Reveal_lin.run
```

3. The Welcome To Lattice Radiant Reveal setup dialog box opens.
4. Click **Next** to open the Installation Folder dialog box.
5. The default destination folder is /home/lattice/lscc/reveal/diamond/3.14. Click **Browse** to change the destination folder.
6. Click **Next** to open the Select Components dialog box.
7. Click **Next** to open the License Agreement dialog box.
8. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
9. Click **Next** to Ready to Install dialog box. Review the destination folder and components selected. If everything is correct, select **Install** to start the installation.
10. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

Installing Stand-Alone Programmer

Programmer is included in the Diamond installation and consists of five tools:

- Programmer
- Deployment Tool
- Download Debugger
- Programming File Utility
- Model 300 Programmer

If you want to use Programmer, Deployment Tool, Download Debugger, Programming File Utility, or Model 300 Programmer without installing Lattice Diamond, use one of the following files to install the stand-alone Programmer:

- **3.14.0.75.2_Diamond_Programmer_lin.run** for 64-bit systems.

To install the stand-alone Radiant Programmer:

1. Close all applications before starting installation
2. Go to Radiant software installers directory and execute the Radiant Programmer run file.

```
% cd <directory_with_RUN>
% ./3.14.0.75.2_Diamond_Programmer_lin.run
```

3. The Welcome To Lattice Radiant Programmer setup dialog box opens.

4. Click **Next** to open the Installation Folder dialog box.
5. The default destination folder is /home/lattice/lscc/programmer/radiant/2024.1. Click **Browse** to change the destination folder.
6. Click **Next** to open the Select Components dialog box.
7. Click **Next** to open the License Agreement dialog box.
8. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
9. Click **Next** to Ready to Install dialog box. Review the destination folder and components selected. If everything is correct, select **Install** to start the installation.
10. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

Installing Stand-Alone Power Estimator

Power Estimator is included in the Diamond installation. If you want to use the tool without installing Lattice Diamond, use one of the following files to install the stand-alone Power Estimator:

- 3.14.0.75.2_Diamond_PowerEstimator_lin.run for 64-bit systems.

To install the stand-alone Power Estimator:

1. Close all applications before starting installation
2. Go to Radiant software installers directory and execute the Radiant Power Estimator run file.

```
% cd <directory_with_RUN>
% ./3.14.0.75.2_Diamond_PowerEstimator_lin.run
```

3. The Welcome To Lattice Radiant Power Estimator setup dialog box opens.
4. Click **Next** to open the Installation Folder dialog box.
5. The default destination folder is /home/lattice/lscc/powerestimator/diamond/3.14. Click **Browse** to change the destination folder.
6. Click **Next** to open the Select Components dialog box.
7. Click **Next** to open the License Agreement dialog box.
8. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
9. Click **Next** to Ready to Install dialog box. Review the destination folder and components selected. If everything is correct, select **Install** to start the installation.
10. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

Installing and Configuring USB Cable and Parallel Cable

This section provides information on USB cable and parallel cable installation and configuration. These instructions are applicable for 64-bit Linux systems.

Parallel Programming Cable Configuration

Before using the Lattice parallel programming cable, the computer's parallel port must be enabled and have the correct read/write permission. Contact the system administrator if the parallel port is not enabled or does not have the correct read/write permission.

You can check the current permissions of the parallel port by navigating to the `/dev` directory and doing a lookup on the port, as follows

```
% cd /dev ls -l parport0
```

There are two main ways to give read/write permission to the parallel port. The first is to give read/write permission to the parallel port to anyone that has access to that machine. The second is more secure, where only selected individuals will have read/write permission to the parallel port that has access to that machine. Below are the descriptions on how to setup parallel port zero to have read/write permission.

Giving Parallel Port Zero Read/Write Permission to All Users

1. Log in as root.
2. Change directory to the `/dev` directory as follows:

   ```
   % cd /dev <return>
   ```

3. Give read/write permission to parallel port zero (parport0) as follows:

   ```
   % chmod 666 parport0 <return>
   ```

Giving Parallel Port Zero Read/Write Permission to Selected Individuals

There are two files to change on the machine to give selected individuals read/write permission to parallel port zero. Both files are located in the `/etc` directory. The two files are "group" and "nsswitch.conf".

1. Log in as root.
2. Change directory to the `/dev` directory as follows:

   ```
   % cd /dev <return>
   ```

3. Give read/write permission to parallel port zero (parport0) to owner and group as follows:

   ```
   % chmod 666 parport0 <return>
   ```

4. Change directory to the `/etc` directory as follows:

   ```
   % cd /etc <return>
   ```

5. Using your favorite text editor, edit the file "group" as follows:

Add the login name for all the users you want to give read/write permission for parallel port zero by adding the login names to the "`lp:x:7:`" line. This line may vary from system to system. Two examples are shown below.

Example 1: Change:

```
lp:x:7:
```

to:

```
lp:x:7:user_name1,user_name2,etc
```

Example 2: Change:

```
lp:x:7:daemon,lp
```

to:

```
lp:x:7:daemon,lp,user_name1,user_name2,etc
```

where `user_name1, etc.,` are the login names for all the users you want to give read/write permission for parallel port zero. Save the changes and close the "group" file.

6. Using your favorite text editor, edit the file "nsswitch.conf" as follows:

   Look at the group line. Ensure "`files`" is there.

   For example:

   ```
   group: files nis
   ```

7. Reboot for the changes to take effect.

Lattice USB Download Cable Configuration

Programmer software can directly access USB devices using libusb, which accesses the USB file system. To verify that you have the USB library installed, do the following:

1. Plug in the USB cable.
2. On the command line, type:

   ```
   % lsusb
   Lattice USB2A
   ```

   You should see an entry similar to the following:

   ```
   > Bus 001 Device 004: ID 1134:8001
   HW-USBN-2B (FTDI)
   ```

   You should see an entry similar to the following:

   ```
   > Bus 001 Device 003: ID 0403:6010 Future Technology Devices
   International, Ltd FT2232C/D/H Dual UART/FIFO IC
   ```

3. If you receive an error when you type `lsusb,` you probably do not have libusb installed. To install the libusb, go to:

   http://libusb.sourceforge.net/

   The recommended version to install is libusb-0.1.4-3.el7.x86_64.rpm

4. Unplug the USB cable.

Note

The USB cable must be disconnected from the PC when performing the installations. You must have root access and be able to log in as a super user.

Driver Setup for Lattice USB2A and HW-USBN-2B (FTDI) USB Download Cable on Red Hat Linux Enterprise 7/8

Note

User needs to download and install libusb-0.1.4-3.el7.x86_64.rpm first in Red Hat 7.

Automated UDEV Method Configuration

1. Type the following command to execute the script:

   ```
   % sudo <install_path>/data/vmdata/udevsetup_rh7_8
   ```

2. Find your username, which is provided in /etc/group. Log out if required.

   For example:

   ```
   username:x:1000:username
   ```

   The script should terminate with a “Setup successful” output.

3. Replace the "username" with your username in /etc/udev/rules.d/10-local.rules.

Note

You must reboot after creating the plugdev group in /etc/group. If plugdev already exists in /etc/group, you can verify this by typing “id” on the Linux command line.

Manual UDEV Method Configuration:

1. Find your username, which is provided in /etc/group file. Log out if required. For example :

   ```
   username:x:1000:username
   ```

2. Create a working file called 10-local.rules.

3. Add the following information to the 10-local.rules file:

```
#Lattice
SUBSYSTEM=="usb",ACTION=="add",ATTRS{idVendor}=="1134",ATTRS{idProduct}=="8001",MODE==
"0660",GROUP=="username",SYMLINK+="lattice-%n"
#FTDI
SUBSYSTEM=="usb",ACTION=="add",ATTRS{idVendor}=="0403",ATTRS{idProduct}=="6010",MODE==
"0666",GROUP=="username",SYMLINK+="ftdi-%n"
SUBSYSTEM=="usb",ATTRS{idVendor}=="0403",ATTRS{idProduct}=="6010",RUN+="/bin/sh -c
'basename %p > /sys/bus/usb/drivers/ftdi_sio/unbind'"
```

Note

- Each SUBSYSTEM entry must be a single line, or split using the "\" line continuation character.
- Replace the username with your username in above rules.

4. Copy the file into the /etc/udev/rules.d/10-local.rules directory. If a file by this name already exists, simply append the working file to it. For example:

```
% sudo cp 10-local.rules /etc/udev/rules.d/ .
Or, if the file already exists:
% sudo cat 10-local.rules >>/etc/udev/rules.d/10-local.rules
```

5. Give permission to 10-local.rules as follows :

```
% sudo chmod 755 10-local.rules
```

6. Now reload the udev rules by

```
% sudo udevadm control –reload-rules
```

7. Plug in the usb cable.

Giving Lattice USB2A Drivers Read/Write Permission to Selected Individuals

USB Drivers Read/Write Permission Configuration

1. Plug in the USB cable.
2. In the command line, type:

```
% lsusb
```

   - You should see an entry similar to the following:

```
> Bus 001 Device 004: ID 1134:8001
```

3. This mean the USB2A is in Bus 001 and device 004. Go to the directory.

```
% cd /dev/bus/usb/001
```

4. Grant execute permissions to the device. On the command line, type:

```
% sudo chmod 777 004
```

Giving HW-USBN-2B (FTDI) USB Drivers Read/Write Permission to Selected Individuals

USB Drivers Read/Write Permission Configuration

1. Plug in the USB cable.
2. In the command line, type:

```
% lsusb
```

   - You should see an entry similar to the following:

```
> Bus 001 Device 003: ID 0403:6010 Future Technology
Devices International, Ltd FT2232C/D/H Dual UART/FIFO IC
```

3. The FTDI chip is in Bus 001 and Device 003. Go to the directory.

```
% cd /dev/bus/usb/001
```

4. Grant execute permissions to the device. On the command line, type:

```
% sudo chmod 777 003
```

5. Unload the ftdi_sio driver if it is attached to your device.

```
% sudo /sbin/rmmod usbserial
```

6. Unload the USB-serial driver if it is attached to your device.

```
% sudo /sbin/rmmod usbserial
```

Note

If you get the error, "`rmmod: ERROR: Module usbserial is builtin.`" when running the command: "`sudo /sbin/rmmod usbserial`" on RedHat OS, please ignore it and proceed.

Licensing Lattice Diamond Software

The Lattice Diamond development tool and stand-alone Power Estimator are licensed software. In order for you to launch the tools you have to configure a FLEXlm license. The license can be either node-locked to the local machine, or acquired from a license server accessible from a LAN connection. The default location of the license file is `<install_path>/license/license.dat`. If this location is changed, you must set the LATTICE_LICENSE_FILE environment variable to include the new path name.11.19.4.1.

The following environment user variables can be configured.

- **LATTICE_LICENSE_FILE** – A variable for lattice license file setting.
- **SALT_LICENSE_SERVER** – A variable required for launching QuestaSim's **latticeqsim** feature.

Note

- Diamond software permits the creation of configuration bitstreams for all of Lattice Semiconductor's FPGAs. However, a license is required for some devices.
- To use the included Questa Lattice OEM simulator, you need a license with the latticeqsim license feature. The licenses generated for use with the Modelsim Lattice OEM simulator have the latticemsim license feature and must be updated to the new feature to use Questa Lattice OEM. To start qsim, you need to set either the LM_LICENSE_FILE or SALT_LICENSE_SERVER.
- In order to change the LATTICE_LICENSE_FILE variable, you may need to edit the .cshrc or .bashrc configuration file located in your home directory.

License Management Versions

Table 3 lists the version numbers of the FLEXlm lmutil utility, the FLEXlm lmgrd utility, and the Lattice daemon used for license management for 64-bit systems.

Table 3: License Management Utility Versions

Filename	Version	Description
lmutil	11.19.4.1	FLEXlm license server utility
lmgrd	11.19.4.1	FLEXlm end-user utility
lattice	11.19.4.1	The Lattice Semiconductor licensing daemon

Obtaining a License

To register and license your Diamond software:

1. Obtain the host ID of your license server with the following command:

   ```
   % <install_path>/diamond/3.14/ispfpga/bin/lin64/lmutil
   lmhostid
   ```

2. Go to the Licensing section of the Lattice Semiconductor Web site (www.latticesemi.com/license) and follow the on-screen instructions.

   Note

   Lattice Semiconductor supports licensing for a single server or three redundant servers. If you are using three redundant servers, enter all three server host IDs on the License File/Registration Form.

   Lattice Semiconductor will send your Diamond license file (license.dat) to you by e-mail within one working day. After you receive the license file

from Lattice Semiconductor, copy the license.dat file to the Diamond license directory as follows:

```
% <install_path>/diamond/3.14/license/license.dat
```

Editing the License File

You must edit a floating license file to specify the server name and the path to the Lattice daemon.

The following example shows part of a floating license file:

```
SERVER nodename 1234abcd 1710
DAEMON lattice daemon_path
FEATURE LSC_RADIANT lattice 2025.06 12-jun-2025 1 4AB180876D89
\
VENDOR_STRING=LSC_RADIANT
FEATURE LSC_SYNPLIFYPRO1 lattice 2025.06 12-jun-2025 1
D86E40930FFB \
VENDOR_STRING="ispLEVER System with
Synplicity Pro 1"
FEATURE LSC_CTL_PROPBLD lattice 2025.06 12-jun-2025 1
8AE4CA6C0D82 \
VENDOR_STRING=LSC_CTL_PROPBLD
FEATURE LSC_CTL_PROPSDK_PFR lattice 2025.06 12-jun-2025 1 \
45FBE5EEB71D
VENDOR_STRING=LSC_CTL_PROPBLD
```

Edit the SERVER line by replacing the *nodename* with the host name and the port ID (1710). The port ID, 1710 in this example, must be assigned a TCP/IP port number that is not already in use on the server, so you might need to change it.

Edit the Lattice DAEMON line, replacing *daemon_path* with the path to Diamond software. For lmgrd V11, the path is:

```
% <install_path>/diamond/3.14/ispfpga/bin/lin64/lattice
```

Edit the QuestaSim DAEMON line, replacing *daemon_path* with the path to QuestaSim Lattice Edition. For QuestaSim, the path is:

```
% <install_path>/diamond/3.14/questasim/license_server/saltd
```

When editing these lines, type them exactly as you received them. All entries are case-sensitive.

Note

The encryption codes are in hexadecimal format (digits 0-9, and lower-case letters a-f or upper-case letters A-F).

$HOME/.flexlmrc can be used to set LATTICE_LICENSE_FILE variable, and you should do the cleanup if it’s necessary.

Starting the License Manager

Type the following command on one line to start the license manager daemon:

```
% <install_path>/diamond/3.14/ispfpga/bin/lin64/lmgrd
  -l <install_path>/diamond/3.14/license/license.log
  -c <install_path>/diamond/3.14/license/license.dat
```

Redirecting output to a log file is helpful when you debug licensing problems. The -l switch tells the license manager to send its output to a log file (license.log), and -c tells it which license to serve. The log file contains information on the status of the server and the daemon and TCP port in use. It also shows which users have checked out the license and the checkout time.

Stopping the License Manager

If it is necessary to stop the FLEXlm license manager, follow this procedure:

1. Confirm that the daemon is running by typing the following command:

   ```
   % ps -ef | grep lmgrd
   ```

2. If lmgrd.exe is running, type the following command on one line to stop the daemon:

   For 64-bit systems:

   ```
   % <install_path>/diamond/3.14/ispfpga/bin/lin64/lmutil
   lmdown -c <install_path>/diamond/3.14/license/license.dat
   ```

   The following prompt appears:

   ```
   Shutting down FLEXlm on nodes: <hostname>
   Are you sure? [y/n]:
   ```

3. Type **Y** and press **Enter** to shut down the license daemon.

Installing and Running the License Manager on a Remote Server

You can install and run the License Manager from a location other than the default directory.

To install the License Manager to a different location, copy the files lattice, lmgrd, and lmutil from the following directory:

```
% <install_path>/diamond/3.14/ispfpga/bin/lin64/
```

to the desired location. For example:

```
% <remote_server_install_path>/my_machine/lattice_license/
```

Starting the License Manager from a Remote Server

Type the following command on one line to start the license manager daemon:

```
% <remote_server_install_path>/lmgrd
  -l <install_path>/diamond/3.14/license/license.log
  -c <install_path>/diamond/3.14/license/license.dat
```

Stopping the License Manager on a Remote Server

If it is necessary to stop the FLEXlm license manager running on a remote server, follow this procedure:

1. Confirm that the daemon is running by typing the following command:

   ```
   % ps -ef | grep lmgrd
   ```

2. If lmgrd.exe is running, type the following command on one line to stop the daemon:

   ```
   % <remote_server_install_path>/lmutil lmdown -c
   <install_path>/diamond/3.14/license/license.dat
   ```

   The following prompt appears:

   ```
   Shutting down FLEXlm on nodes: <hostname>
   Are you sure? [y/n]:
   ```

3. Type **Y** and press **Enter** to shut down the license daemon.

Setting Up a Floating License on Linux

The licensing steps just outlined can be performed on a centralized license server. Then each client points to the license file on that machine.

To gain access to the licenses on the remote license server, you need to set the environment variable LM_LICENSE_FILE value to *license_port_number@linux_host_name*.

Note

Lattice Diamond software uses the following network communication ports (TCP/IP socket ports):

- Port 80 – This is the standard HTTP web access port. Diamond uses this port in the following cases:
  - When the Diamond software has updates from the Lattice web site:
  - IP or reference designs are downloaded from the Lattice web site:
  - When message ID's are sent.
- Port 7788 – This is the port used by the Diamond software to check the floating license between the software and license server. This port is configurable by changing the license files.

Troubleshooting a Floating License

The following procedures can be useful in troubleshooting common floating license issues.

Check the Network

Use the ping command to check network status. For example, type:

```
% ping <license_server>
```

If the license server is running, you can expect a return as follows:

```
64 bytes from <license_server> <IP_address>
```

To end, type CTRL+C.

Check License File with lmutil

Use the lmutil tool to troubleshoot the status of your license file. The lmutil tool is located in the following location:

<*install_path*>/diamond/3.14/ispfpga/bin/lin64

The lmstat command determines the features of your license file.

- The -a argument displays all information.
- The -c argument uses the specified license files.

The following is an example of using the lmutil lmstat command to check the license file status:

```
% ./lmutil lmstat -a -c <license_port>@<license_server>
```

The license status is returned, including feature lines, number of licenses issued, and licenses in use.

Running the Lattice Diamond GUI

The Lattice Diamond software has a graphical user interface (GUI). When you run the diamond 3.14 executable file, the software automatically performs the environment setup.

To start the Lattice Diamond GUI:

1. Set up the license as follows:

If your license file (license.dat) is not under <*install_path*>/3.14/license, you must set the LM_LICENSE_FILE variable to the location of your license file. For example:

For CSH users:

```
% setenv LM_LICENSE_FILE (/<license_directory>/license.dat
$LM_LICENSE_FILE)
```

For BASH users:

```
% export LM_LICENSE_FILE=$LM_LICENSE_FILE:/
<license_directory>/license.dat
```

2. Run the diamond executable file in the command line as follows:

```
% <install_path>/diamond/3.14/bin/lin64/diamond &
```

With the `diamond` script, you can also run the following tools in stand-alone mode.

To invoke stand-alone Power Calculator, run:

```
% diamond -pwc
```

To invoke stand-alone Reveal Analyzer, run:

```
% diamond -rva
```

To invoke stand-alone IPexpress, run:

```
% diamond -ipx
```

To invoke stand-alone Epic, run:

```
% diamond -epic
```

Refer to the online Help for more information about the Diamond GUI.

Using the Examples Directory

In order to use the design examples directory, you must copy the files from the server to your local system and change the write permissions. Copy the files from the server examples directory (<*install_path*>/diamond/3.14/examples) to the equivalent path and directory on your local system.

Finding the Installation History

The Diamond software records a log of your installation history. You can find the history in the Diamond main window.

To view the installation history:

1. Open the Diamond GUI.
2. Choose **Help > About Lattice Diamond**.

Running Lattice Diamond from the Command Line

There are two ways to run from the command line: through Diamond's Tcl Console or by running executable files directly.

Running Stand-Alone Tcl Console

The Lattice Diamond development environment includes Tcl Console, which allows you to run scripts for automating common tasks. Tcl Console is also available outside of the user interface in order to run custom scripts. To launch the stand-alone Tcl Console, enter the following on a command line:

```
% <install_path>/diamond/3.14/bin/lin64/diamondc
```

These commands configure the environment allowing all of the underlying design tools to be run. Refer to the online Help for more information about the command line.

Running Using CSH or Bash Interpreters

Before running any other commands, you need to run the following command:

```
% cd <install_path>/diamond/3.14/bin/lin64
% source setupenv
```

BASH users must run the following commands:

```
% export bindir=<install_path>/diamond/3.14/bin/lin64
% source $bindir/diamond_env
```

After that, you can run the executable files directly. For example, you can invoke the Diamond GUI by:

```
% pnmain &
```

Or, you can run Power Calculator by running:

```
% pwcmain &
```

Running Synplify Pro for Lattice

To run Synplify Pro for Lattice, do the following:

1. Open the Diamond GUI.
2. Open any project to enable the commands on the Tools menu.
3. Choose **Tools > Synplify Pro for Lattice**.

Running Stand-Alone Reveal Analyzer

After the installation, you can invoke the stand-alone Reveal Analyzer in the command line:

```
% <install_path>/reveal/3.14/bin/lin64/revealrva &
```

Running Stand-Alone Programmer

After the installation, you can invoke the stand-alone Programmer in the command line:

```
% <install_path>/programmer/3.14/bin/lin64/programmer &
```

Running Stand-Alone Deployment Tool

After the installation, you can invoke the stand-alone Deployment Tool in the command line:

```
% <install_path>/programmer/3.14/bin/lin64/deployment &
```

Running Stand-Alone Debugger

After the installation, you can invoke the stand-alone Debugger in the command line:

Running Download Debugger on 64-bit systems:

```
% <install_path>/programmer/3.14/bin/lin64/debugger &
```

Running Stand-Alone Programming File Utility

After the installation, you can invoke the stand-alone Programming File Utility in the command line:

```
% <install_path>/programmer/3.14/bin/lin64/fileutility &
```

Running Stand-Alone Model 300 Programmer

After the installation, you can invoke the stand-alone Model 300 Programmer in the command line:

```
% <install_path>/programmer/3.14/bin/lin64/model300 &
```

Running Stand-Alone Power Estimator

After the installation, you can invoke the stand-alone Power Estimator in the command line:

Note

The stand-alone Power Estimator requires a license. See “Licensing Lattice Diamond Software” on page 19.

```
% set ROOT="<install_path>/powerestimator/3.14"
% set platform=lin64
% setenv LD_LIBRARY_PATH ${ROOT}/ispfpga/bin/
${platform}:${ROOT}/bin/${platform}
% set path=(${ROOT}/ispfpga/bin/${platform} ${ROOT}/bin/
${platform} $path)
% ${ROOT}/bin/${platform}/pwcwrap est &
```

Running Multiple Versions of Lattice Software

You can run multiple versions of ispLEVER and Lattice Diamond at the same time from either the command line or the graphical user interface. You can run current and previous versions.

Updating Lattice Diamond

After you have registered and licensed your installation, check the Lattice Semiconductor Web site for new software updates, device support, and enhancements. Make sure that you have the latest software by checking for updates regularly.

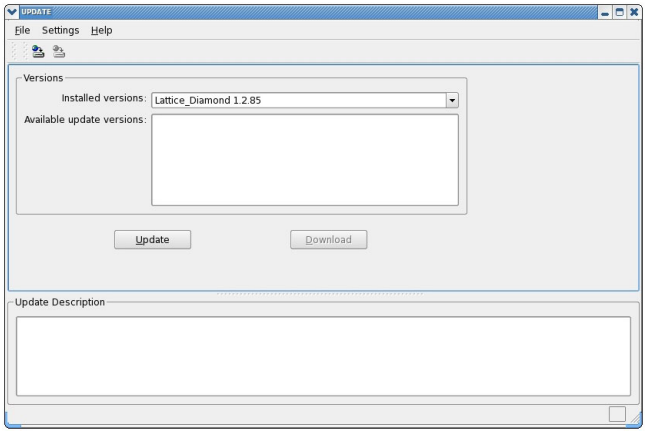
Running the UPDATE Tool

To run the UPDATE tool:

- Run the update executable file in the command line:

  ```
  % update
  ```

  The UPDATE window appears, as shown below.

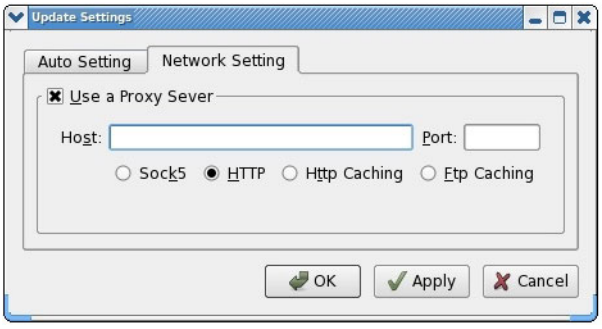


Changing the Network Setting

To enable online checking for software updates, you must indicate how your computer accesses the Internet.

To change the Internet connection settings:

1. In the UPDATE window, choose **Settings > Update Settings**.
2. In the Update Settings dialog box, select the **Network Setting** tab.



3. In the Network Setting tab, do either of the following:
   - If you must go through a proxy server before connecting to the Internet, select **Use a Proxy Server** (it is selected by default). The proxy server prevents outsiders from breaking into your organization's private network. Ask your system administrator for the URL address and port assignment.
   - If you use direct Internet access, clear the **Use a Proxy Server** option.
4. Click **OK**.

Downloading and Installing Software Updates

When you use the automatic checking feature, the Diamond software notifies you whenever an update version becomes available.

You can also manually check for software updates.

To manually check for and download a Diamond update version:

1. In the UPDATE window, click **Update**.

   The software goes online to check for updates, and lists the available Diamond update versions (if any) in the Available update versions box.

2. Select the update version that you want to download, and click **Download**.

   The software starts downloading the installer of the update version to your computer. You may install it later.

Note

You can also use the **Help > Check for Updates** command in the Diamond window to check for and download software update.

To install a downloaded Diamond update version:

1. Close all Diamond tools.
2. Uncompress the downloaded installer.
3. Go to the location where you put the uncompressed installer.
4. From the command line, execute the RPM installation file.

   Note

   You need the root privilege to install an RPM package.

Installing LatticeMico Development Tools

This document explains how to install LatticeMico Development Tools on the Linux operating system.

System and Software Requirements

Your system must meet the following minimum system and software requirements to run LatticeMico Development Tools on Linux.

System Requirements

- Intel Pentium or Pentium-compatible PC with USB port
- 64-bit Red Hat Enterprise Linux version 7.9, 8.8 operating system
- 2 GB memory recommended for FPGAs
- Approximately 436 megabytes of free disk space
- 1024 x 768 graphics display

Software Requirements

- Perl version 5.8.0 or later. The following Perl modules are required:
  - XML::DOM
  - XML::Parser
  - XML::RegExp
  - Getop::Std

- Scalar::Util
- FindBin::Bin

These modules are normally found in the native version of Perl that comes with Red Hat Linux.

- PDF browser, such as Adobe Acrobat
- Mozilla or Netscape browser (optional)

Additional Notes for Linux

You may need the following information to run LatticeMico on Linux:

- If you want to configure your system to use an external browser instead of the Eclipse help browser, you can change this in the LatticeMico main window by choosing the **Window > Preferences** command.
- Eclipse requires shared libraries from the Mozilla (also known as Seamonkey) Web browser. The Eclipse software expects to find a set of IA32 shared libraries. It may be necessary for you to manually configure the MOZILLA_FIVE_HOME environment variable to point to a valid Mozilla browser library installation.
- If you cannot access the PDF files referenced in the LatticeMico online Help, you can configure LatticeMico to use an external browser by following these steps:

  a. In the LatticeMico software, choose **Window > Preferences**.

  b. Click on **Help**.

  c. Select **Use external browser**.

  d. Click on **Web Browser**.

  e. Select **Use external Web browser**.

  f. Select **Firefox** or **Netscape**.

  g. Click **OK**.

Installing LatticeMico Within Diamond Software

LatticeMico Development Tools is included in the Diamond installation option now. You can select it when installing Lattice Diamond.

To take advantage of the full features and functionality of the LatticeMico Development Tools, Lattice Semiconductor recommends that you install the 3.14 version of Diamond and the LatticeMico Development Tools.

Users designing with Platform Manager 2 devices must install LatticeMico System with Diamond in order to make the Diamond Platform Designer software functional.

This section describes how to install the LatticeMico Development Tools within the Diamond software.

Note

The LatticeMico software is integrated into the Diamond installation now.

To install LatticeMico Development Tools:

1. Select the **LatticeMico** in components page when install Lattice Diamond 3.14.
2. After the installation is completed, verify that the /micosystem directory is created in the <*install_path*>/diamond/3.14 directory, for example, $HOME/lscc/diamond/3.14/micosystem.
3. You can then run LatticeMico System as follows:

```
% <install_path>/diamond/3.14/micosystem/LatticeMicoLauncher
&
```

LatticeMico System Library Dependencies

LatticeMico System for Linux depends on a set of system libraries that are different from the Diamond base release package.

The following packages are the packages on which lLMS_1.2_for_Diamond3.14_lin.run are dependent. Indirect dependencies are listed with indented levels.

- glibc
  - nss-softokn-freebl
- libjpeg
- glib2
  - libselinux
  - gamin
- libusb
- freetype
- fontconfig
  - expat
- libX11
  - libxcb
    - libXau
- libICE
  - libSM

- libuuid
- libXt
- libXext
- libXrender
- libXi
- libXft
- libXtst
- alsa-lib
- atk
- nss
  - nss-util
    - nspr-devel
      - nspr
  - nss-softokn
    - sqlite
      - readline
        - ncurses-libs
- gmp
- pango
    - cairo
    - libthai
      - libpng
        - pixman
    - libXcomposite
      - libXfixes
    - libXdamage
    - libXinerama
    - libXrandr
- compat-expat1
- compat-libstdc++-33
- cups-libs
  - avahi
    - audit-libs
    - avahi-libs
        - dbus-libs
    - libcap

- libattr
- libdaemon
- libtiff
- gnutls
- keyutils-libs
- krb5-libs
- libgcrypt
- libgpg-error
- libtasn1
- gtk2
  - jasper-libs
- perl-XML-DOM
- perl-XML-RegExp

Running LatticeMico System

After LatticeMico System is installed, enter the following command to run the software:

```
% <install_path>/latticemicosystem/3.14/LatticeMicoLauncher &
```

Revision History

The following table gives the revision history for this document.

Date	Version	Description
10/21/2024	3.14	Updated to reflect changes in Diamond 3.14.
9/20/2023	3.13	Updated to reflect changes in Diamond 3.13.