Lattice Diamond 3.14 Installation Guide for Windows

October 21, 2024

Copyright

Trademarks

Disclaimers

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 chapter provides installation instructions for the Lattice Diamond® 3.14 software for Windows.

Diamond supports 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.

Lattice Diamond is available in 64-bit versions.

- The 64-bit version of Lattice Diamond is optimized to run on Windows 64-bit systems. The 64-bit version of Lattice Diamond must be running on Windows 64-bit systems.

System Requirements

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

- Intel x86 64-bit or 64-bit-compatible PC
- Windows 10/11 (64-bit)
- Approximately 10 GB free disk space
- RAM adequate for your FPGA design. For guidelines see Memory Requirements.

- Network adapter

Note

A node-locked license is based on the physical (hard-coded) address provided by the network adapter. Network connectivity is not necessarily required for a node-locked license. In the absence of a network connection, you can install the NWLink IPX/SPX protocol to force the recognition of your NIC card ID (see “Licensing for Diamond and Stand-Alone Power Estimator” on page 12).

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

- 1024 X 768 graphics display
- Microsoft-compatible mouse and mouse driver
- A Web browser with Javascript capability
- Adobe Acrobat Reader

Memory Requirements

Table 1 lists the minimum memory requirements and the recommended memory for all the Lattice Semiconductor FPGA families. Designing for the largest FPGAs may require more than the usual 2 GB of memory. For help in extending your memory to 3 or 4 GB, see “Extending Memory” on page 8.

Table 1: Recommended Memory for Windows

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 Windows (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

Extending Memory

Designing for ECP5 or LatticeECP3 may require more than the 2 GB normally available with Windows systems. But you can configure Windows to use up to 3 GB of memory.

Note that increasing the amount of memory available to applications decreases the amount available for the file cache, paged pool, and nonpaged pool, which can affect applications with heavy networking or I/O.

To increase application memory: Use the **BCDEdit /set increaseuserva 3072** command to set the boot entry option to 3 GB. For details, see Microsoft article “BCDEdit /set”:
msdn.microsoft.com/en-us/library/ff542202.aspx

Contacting Technical Support

FAQs The first place to look. 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.

Installing Diamond 3.14 for Windows

The following sections describe product options and installation instructions for Diamond.

Software Product Options

Table 2 shows the product options for the installation of Diamond for 64-bit versions.

Table 2: Diamond Design Tools Installation Options

Product Option	Description
Diamond for Windows	Installs the Diamond design tools for all Lattice Semiconductor FPGA designs. Table 3 lists the tools included in this option.
FPGAs	Installs the FPGA design environment.
Synplify Pro for Lattice	Installs the Synopsys® Synplify Pro® for Lattice synthesis tool. A license for Synplify Pro is included.
QuestaSim Lattice Edition	Installs Siemens® QuestaSim™ Lattice Edition simulation tool. A license for QuestaSim is included.
Programmer Drivers	Installs drivers for the Programmer tool, which loads FPGAs with the designs.

Table 3 shows the tools included in the Diamond for Windows option.

Table 3: Tools included in the Diamond for Windows Option

Tool	Description
Project Management Tools	Include the Reports view, Run Manager, and the Security Setting tool to enable you to create and maintain the project, keep track of the stages in the design implementation process, review reports, and compare different implementations of the project.
Design Entry Tools	Include Source Editor, Schematic Editor, Symbol Editor, Symbol Library Manager, Clarity Designer, IPexpress, Memory Generator, and HDL Diagram, which offer VHDL, Verilog, EDIF, schematic, and mixed-mode design entry support and design structure check. Platform Designer is available for Platform Manager 2 devices only.
Design Simulation Tools	Include Simulation Wizard, QuestaSim Lattice Edition, and Waveform Editor for performing functional simulation for the projects and creating the test stimulus files.
Design Constraints Application Tools	Include Spreadsheet View, Package View, Device View, Netlist View, NCD View, Floorplan View, Physical View, and Netlist Analyzer to enable you to set constraints for implementing the design.
Design Implementation Tools	Include Synplify Pro for Lattice, Lattice Synthesis Engine (LSE), Clear Tool Memory, Design Translation, Map, Place & Route, and Bit Generation to ease the design implementation process.
Analyzing Static Timing, Power Consumption, and Signal Integrity Tools	Include Timing Analysis View and Power Calculator to enable you to estimate the design performance, experiment with different configurations, and to calculate power consumption.
Programming the FPGA Tool	Include Programmer, Deployment Tool, Download Debugger, Programming File Utility, and Model 300 Programmer tools to let you program the FPGAs.
Testing and Debugging On-chip Tools	Include Reveal Inserter and Reveal Analyzer to let you complete the final stage of developing a design: testing in the actual FPGA, either on a test board or in your system.

Table 3: Tools included in the Diamond for Windows Option (Continued)

Tool	Description
Applying Engineering Change Order Tool	Includes ECO Editor which supports engineering change orders by editing the output files from the place-and-route stage of the design implementation process.
EPIC Device Editor	Provides device editing capability for engineering change management and detailed manipulation of FPGA implementation.
HTML Help and User Documentation	Includes complete instructions for designing with Diamond design tools and third-party tools. Also provides user manuals, tutorials, example design projects, and access to technical documentation from the Lattice Semiconductor Web site.
Tcl/Tk Scripting Tool	Enables you to automate Diamond design processing.

Note

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

Installation Procedure

The Lattice Diamond software is available for download from the Lattice Diamond Downloads & Licensing web page located at 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.

To install the Lattice Semiconductor Diamond software:

1. Close all applications before starting Diamond installation.
2. Double-click on the Diamond installer you downloaded to launch the installation process.
3. The Welcome To Lattice Semiconductor Diamond Setup dialog box opens.
4. Click **Next** to open the License Agreement dialog box.
5. Read the license agreement. If you agree, click **Yes** to open the Choose Destination Location dialog box.
6. The default destination folder is C:\lscc. Click **Browse** to change the drive or destination folder.
7. Click **Next** to open the Product Options dialog box.
8. Select the Diamond components that you want to install by selecting or clearing each of the listed options. If you have purchased third-party synthesis and simulation tools directly from the third-party vendors, you

can clear the **Synplify Pro for Lattice** and **QuestaSim Lattice Edition** product options.

The FPGAs product option has additional options for selecting the Lattice FPGA devices that you want to install. To set the additional options, select **FPGAs** and click **Change**.

In the pop-up Select Subfeatures dialog box, you can select or deselect the features from the list. Click **Continue** to come back to the Product Options dialog box.

9. Click **Next** to open the Select Program Folder dialog box. The default name of the program group is **Lattice Diamond 3.14** (or **Lattice Diamond 3.14 (64-bit)** if you installed the 64-bit version). If you want to change the name, change it in the Program Folder text box..

Note

Clicking the Cancel button cancels the entire Diamond installation.

10. In the Create Shortcut on Desktop dialog box, select desired option and click **Next**.

Parallel port or USB drivers are required to program Lattice devices using the Lattice download cables. To install the drivers, you should have administrative privileges.

Three drivers are installed with the Programmer Download Parallel/USB Port Driver dialog box.

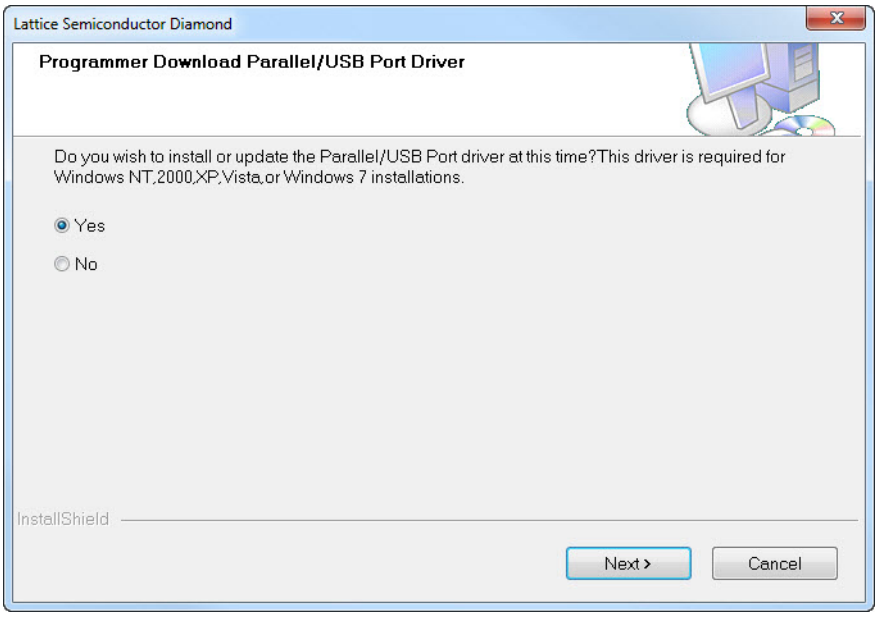
- **Parallel port driver** – Supports device programming through the parallel port of your PC. The driver can be installed on Windows 7, Windows 8/8.1, and Windows 10.
- **USB port driver** – Supports device programming through the USB port of your PC. The driver can be installed on Windows 7, Windows 8/8.1, and Windows 10. This is for the HW-USBN-2A USB cable.
- **FTDI USB driver** – This supports Lattice HW-USBN-2B USB cable and Lattice evaluation boards with FTDI (Future Technology Devices International) USB host chip. The driver does not support Windows 2000 and earlier operating systems.

Note

The first time the FTDI driver is installed, the Windows operating system may report that Windows can't verify the publisher of this driver software. Select “Install this driver software anyway.” This warning will not occur on subsequent installations.

13. In the Programmer Download Parallel/USB Port Driver dialog box (Figure 1), select the desired option and click **Next**.
14. In the Start Copying Files dialog box, verify Diamond environment settings and click **Next**.

Figure 1: Programmer Download Parallel/USB Port Driver Dialog Box



15. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

Note

Do not close the installation window. The window will automatically close when the installation completes.

Licensing for Diamond and Stand-Alone Power Estimator

At the end of the installation, you will use the Lattice website-based licensing capability to license your Diamond and stand-alone Power Estimator software.

Note

The available devices for Diamond can vary, depending on the type of license.

To use the software, you must receive a Lattice Semiconductor software license based on the identification of your network interface card (NIC). The NIC ID or equivalent is the 12-character hexadecimal physical address of your wired Ethernet interface or other active network interface. License your software early to avoid any down time.

To obtain a license file for your Diamond software:

1. Go to Lattice Semiconductor Software Licensing page: www.latticesemi.com/license.
2. Select Lattice Diamond.

   You will get the Lattice Diamond Software Licensing page.
3. Follow the on-screen instructions.
4. Place the attached "license.dat" file in the <*path*>\license directory of your Lattice Diamond Software installation.

Note

If you want to modify the path to the license.dat file, change the Environment Variable that points to LM_LICENSE_FILE.

Finding the Installation History

Diamond records a log of the installation history, which you can find from the Diamond main window.

To view the installation history:

1. Open the Diamond main window.
2. Select **Help > About Lattice Diamond**. See the Installation History tab

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.txt`. 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 Environment Variables.

Setting Up a Floating License

To enable a floating license, you must have a license server set up on a Windows NT server to monitor your Diamond software license. Each client PC must have the LATTICE_LICENSE_FILE variable set to point to the license file on the server.

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.

Before you start the server setup, ensure that TCP/IP is installed and that the client machines can communicate with the server by name. At the prompt in an MS-DOS window, type the following:

```
ping <hostname>
```

Table 4 lists the files used for license management for 64-bit systems. The files are located at:

<*diamond_install_path*>\ispFPGA\bin\nt64

Table 4: License Management Files

Filename	Version	Description
LMGRD.exe	11.19.4.1	The license server program
LMUTIL.exe	11.19.4.1	FLEXlm utility for diagnosing, reporting, and controlling licensing
LMTOOLS.exe	11.19.4.1	Program that sets up the server for floating licenses
lattice.exe	11.19.4.1	The Lattice Semiconductor licensing daemon

Note

Users of the ispLEVER 7.0 or older software must bring down the previous license daemon and start the new license daemon.

Editing the License File

After obtaining a floating license from Lattice Semiconductor, you must edit the license file to specify the server name and the paths to the Lattice daemon. An example of a floating license file is shown below.

```
SERVER LMN10812 bcaec5d7e446 7788
DAEMON lattice C:\lscc\diamond\3.14\ispfpga\bin\nt64\lattice.exe

DAEMON saltd C:\lscc\diamond\3.14\questasim\license_server\saltd.exe
INCREMENT latticemsim mgcld 2024.10 26-jul-2025 1 BF883DCA1C57910C7FF1
\
    VENDOR_STRING=CF758C76 ISSUER="ModelSIM/Questa Lattice"
SN=293045538 \
    SIGN2="0F93 A694 631C 7A5E 10A5 8410 5973 4A60 6980 0C1A A215 14E7
\
    E450 97D0 8E45 166A DEDF 1C8B 208F 6909 F25B 13CA F636 CEFF A6A0
5A3C \
    C574 DCC2 3ECE 09BC"

INCREMENT latticeqsim mgcld 2024.10 26-jul-2025 1 CF582DEA78776A6CF496
\
    VENDOR_STRING=9C83414D ISSUER="ModelSIM/Questa Lattice"
SN=293045537 \
    SIGN2="08A2 7C43 9E89 C447 76EC EA49 99C2 D1FC 7C29 869E 8DD9 2AC3
\
    AD80 BD48 53B1 1ACB 8C0E B8F8 890A 7613 A747 29C6 FCCC A37A 575B
5C60 \
    2897 1B13 944B DA26"
```

Note

The “\” followed by a carriage return indicates a line continuation.

To edit the license file:

1. Edit the `SERVER` line by replacing *`nodename`* with the host name of the server for which you requested your license.dat file. You may also need to change the PORT NUMBER (7788).
2. Edit the `DAEMON lattice` line by replacing *`daemon_path`* with the path to the lattice daemon, for example:

   ```
   C:\lscc\diamond\3.14\ispfpga\bin\nt64\lattice.exe
   ```

3. Edit the `DAEMON` QuestaSim line by replacing *`daemon_path`* with the path to the QuestaSim Lattice Edition daemon, for example:

   ```
   C:\lscc\diamond\3.14\questasim\license_server\saltd.exe
   ```

When you are editing these lines, make sure that they are typed exactly as you received them.

License Server Setup

To set up your license manager as a system service:

1. Copy the license file (license.dat) to <*diamond_install_path*>\license**license.dat**.
2. Double-click the <*diamond_install_path*>\ispfpga\bin\nt64**lmtools.exe** file to open the LMTOOLS dialog box.

Note

Windows 7 users may need to right click on LMTOOLS.exe and select **Run as Administrator**.

3. Choose the **Config Services** tab in the LMTOOLS dialog box.
4. Change Service Name to **Lattice FLEXlm Service 1**.
5. Browse and set lmgrd.exe to <*install_path*>**\ispfpga\bin\nt64\lmgrd.exe**.
6. Browse and set the license file to <*install_path*>**\license\license.dat**.
7. Browse and set the debug log file to <*install_path*>**\license\lattice.log**.
8. Click **Save Service**.
9. Select the **Start/Stop/Reread** tab.
10. Click **Start Server**.
11. Select the **Config Services** tab.
12. Select **View Log** to view the lattice.log file. Check to see if there are any problems starting the license server. If there are no problems, close the log file.
13. Choose **Start > All Programs > Lattice Semiconductor > Lattice Diamond 3.14** to verify license checkout (this will be reflected in the lattice.log file). Close Diamond.
14. Choose the **Start/Stop/Reread** tab in the LMTOOLS dialog box.

15. Select **Stop Server**.
16. Select the **Config Services** tab. Select **Use Services** and **Start Server at Power-Up**.
17. Click **Save Service**, and then select **File > Exit.**
18. Restart the Windows server system.
19. Start Diamond again to verify that the license server is running as a service.

Windows License Server Setup for QuestaSim Lattice Edition

If you want to run the QuestaSim Lattice Edition software, you must have a separate license file for QuestaSim Lattice Edition installed.

The steps below show you how to setup a server-based license for QuestaSim Lattice Edition.

Modify the license file.

See below for the example:

```
SERVER nodename 283A4D51E5C8 1717
DAEMON saltd path_to_saltd
INCREMENT latticemsim mgcld 2020.10 24-sep-2021 42F51711882B1345257E8 \
VENDOR_STRING=E0A4806A HOSTID=283a4d51e5c8 ISSUER="ModelSIM Lattice" \
SN=72951337 SIGN2="016B 9A3C 250A 4BE0 4EA2 6214 A021 CABE 0739 573F \
D7E9 BC45 3706 2F63 8829 122B D282 EBFC A8B1 62AB 78C5 4F8E F369 CE8E \
306B F3C5 1F73 4941 503A D5CB"
INCREMENT latticeqsim mgcld 2020.10 24-sep-2021 4 2F51711882B1345257E8\
VENDOR_STRING=E0A4806A HOSTID=283a4d51e5c8 ISSUER="Questasim lattice" \
SN=72951337 SIGN2="016B 9A3C 250A 4BE0 4EA2 6214 A021 CABE 0739 573F \
D7E9 BC45 3706 2F63 8829 122B D282 EBFC A8B1 62AB 78C5 4F8E F369 CE8E \
306B F3C5 1F73 4941 503A D5CB"
```

- Replace nodename with the name of your server or PC.
- Replace path_to_saltd with the path to the saltd executable. In the QuestaSim OEM edition, the path is <install_path>/questasim/license_server/

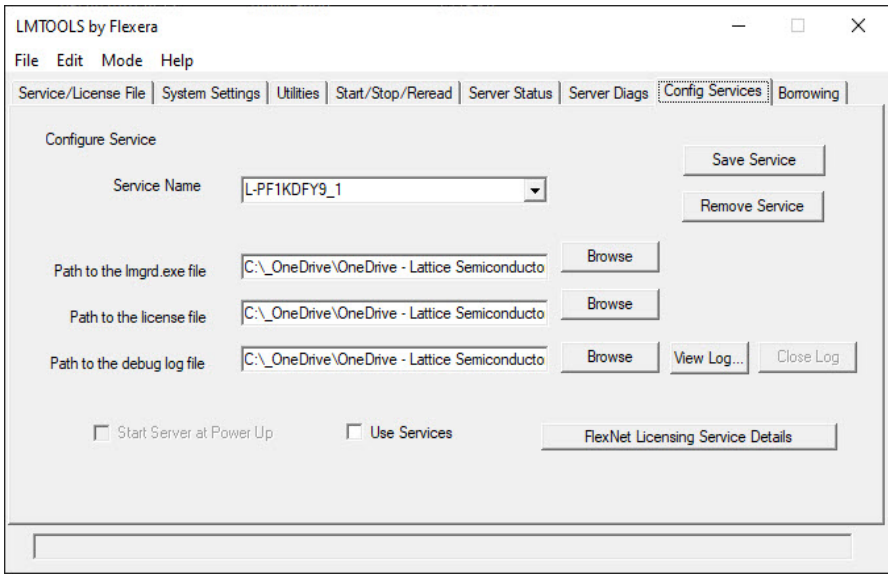
```
SERVER L-PF1KDFY9 283A4D51E5C8 1717
DAEMON saltd C:\Mentor\questasim\license_server\saltd.exe
INCREMENT latticeqsim mgcld 2020.10 24-sep-2021 4
2F51711882B1345257E8\
VENDOR_STRING=E0A4806A HOSTID=283a4d51e5c8 ISSUER="Questasim
Lattice" \
SN=72951337 SIGN2="016B 9A3C 250A 4BE0 4EA2 6214 A021 CABE
0739 573F \
D7E9 BC45 3706 2F63 8829 122B D282 EBFC A8B1 62AB 78C5 4F8E
F369 CE8E \

   306B F3C5 1F73 4941 503A D5CB"
```

Start the license server using LMTools.

Run LMTools is located at: <install_dir>/win32loem/lmtools.exe

1. In the Config Services tab:
   - Create a Service Name
   - Browse to the path of the lmgrd.exe file (<install_dir>/win32loem/)
   - Browse to the path of the license file
   - Browse to the location of where you want to create the log file.
   - Save the Service by click “Save Service” button.

Figure 2: LMTools_Config Services



2. In the Server/License File tab, select “Configuration using Services”
3. In the Start/Stop/Reread tab, click “Start the Server” button.
4. In the Server Status tab, click “Perform Status Enquiry” button to ensure that the server will be started properly.
5. If you see that your daemon is up and see the number of licenses available, your server has started successfully.

Configure your SALT_LICENSE_SERVER environment variable:

- In Control Panel > Advanced system settings > Environment Variables, modify or create your lattice_license_file and SALT_LICENSE_SERVER to include the port@servername.
- In the example SALT_LICENSE_SERVER value is: 1717@L-PF1KDFY9).

Note

Diamond floating license is not available on the website. You need to request a license by filing a Support Case.

Floating License Configuration

In this configuration, Diamond is installed on your license server (for license manager utilities and daemons) and on each client that uses Diamond. This configuration gives the best run-time performance.

After you receive your floating license and ensure that the license manager is running, install Diamond locally on each client that will use the floating license.

Set your system variable SALT_LICENSE_FILE to point to TCP/IP_PORT@hostname

Setting up Floating License on Linux

You can also put the Diamond license on a Linux machine. Then each client (Windows or Linux) points to the license file on the Linux machine. In this case, you need to set the environment variable LM_LICENCE_FILE value to License_Port_number@linux_host_name. Or, have the LM_LICENSE_FILE value set to the path to a license file on the client that is set up with the SERVER name of the Linux_host_name and License_Port_number.

Troubleshooting Licensing Problems

If you encounter problems with your license, refer to Table 5 for common FLEXlm error messages and possible causes or solutions.

Table 5: FLEXlm Error Messages

FLEXlm Error Message	Possible Causes or Solutions
Invalid parameter [-42, 252]	▶ The LATTICE_LICENSE_FILE variable has not been set properly. ▶ The license file is invalid. ▶ An invalid feature is specified in the license file.
Invalid parameter [-42, 252:10061] Winsock error code	▶ You have a floating license, and the license daemon has not been started at the Windows NT server. ▶ The network connection between the server and the client has not been established.
Invalid parameter [-12, 122] Invalid returned data from license server	The node name of the Windows NT server does not match the one in your floating license file.
Invalid parameter [-5, 222] No such feature exists	The feature could not be found in the license file.
! License Check Failed	You either have a node-locked license or you do not have a license file. Contact Lattice Semiconductor Technical Support for a valid floating license file.

If you encounter any software-related problems, review the following common troubleshooting scenarios before calling Lattice Semiconductor Technical Support:

- Ensure that your environment variable settings are set correctly, including the **TEMP** user variable.
- For Windows, your system should contain the following environment settings:

  `SET LM_LICENSE_FILE=<install_path>\license\license.dat`

  You can verify these settings by accessing the **System Properties** dialog box from your Windows system. Select the **Advanced** tab and the **Environment Variables** section.

If Diamond still does not run after you have installed your new license file and confirmed that your environment variables are correct, gather the following items:

- A screen capture showing the error message
- A text file that contains a listing of the environment setup for your PC. From an MS-DOS prompt window, issue the **set > env.txt** command.
- Your license.dat file

Put these items into a zip file and submit a technical support case, including an explanation of the problem.

Running Multiple Versions

Diamond enables you to run FPGA designs on platforms on which Diamond 3.14 and previous ispLEVER or Diamond versions are installed.

Running Diamond

After the installation and the license configuration, you can invoke Diamond.

Running Diamond Locally

If you have installed Diamond on your local machine:

- In Windows 7, choose **Start > All Programs > Lattice Diamond 3.14 > Lattice Diamond**.
- In Windows 8/8.1 or Windows 10, choose **Apps > Lattice Diamond 3.14 > Lattice Diamond**.

The Diamond main window is invoked.

Running Diamond using Windows Remote Desktop

You can also install Diamond on a shared disk, installation procedure of which is exactly the same as that for the local installation. After the license file setup, you can access that shared disk from the Windows Explorer and then invoke Diamond from that installation directory by double-clicking `<boot_drive>:\<diamond_install_directory>\lscc\diamond\3.14\bin\nt4\pnwrap.exe`

When the installation is finished, make sure to set the LATTICE_LICENSE_FILE environment variable to be the location of your license file. When you use a client-server setup, it is recommended that you use a floating license. Then set LATTICE_LICENSE_FILE=7788@*nodename*. Confirm that it works by selecting and compiling one of the examples now on the client.

Updating Lattice Diamond

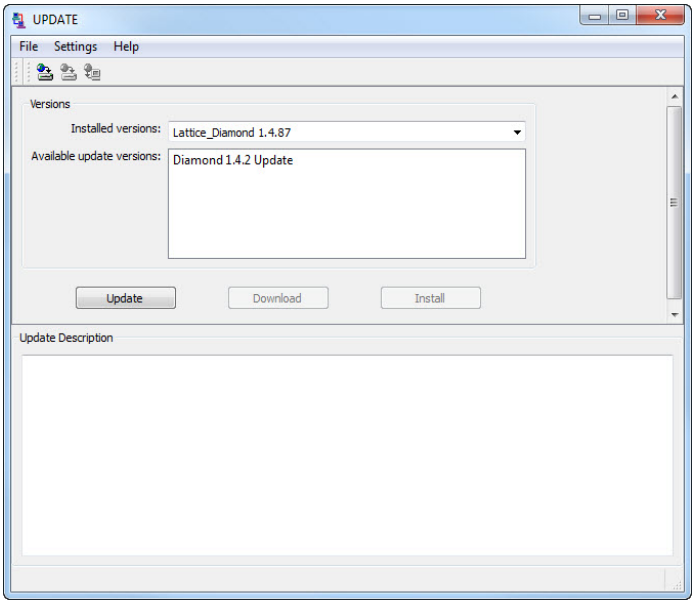
After you have registered and licensed your installation, check the Lattice Semiconductor Web site for new software updates, device support, and enhancements. Make sure that you have the latest software by checking for updates regularly.

To activate UPDATE:

1. Launch UPDATE as follows:
   - Choose **Apps > Lattice Diamond 3.14 > UPDATE**.

   The UPDATE window appears, as shown in Figure 3.

Figure 3: UPDATE Window

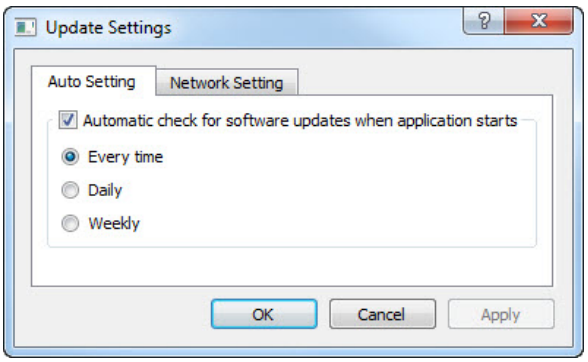


After you invoke UPDATE, it will connect to the Internet automatically to check for updates.

2. In the UPDATE window, click **Settings > Update Settings**.

   The Update Settings dialog box now appears, as shown in Figure 4.

Figure 4: Auto Setting Tab of the Update Settings Dialog Box



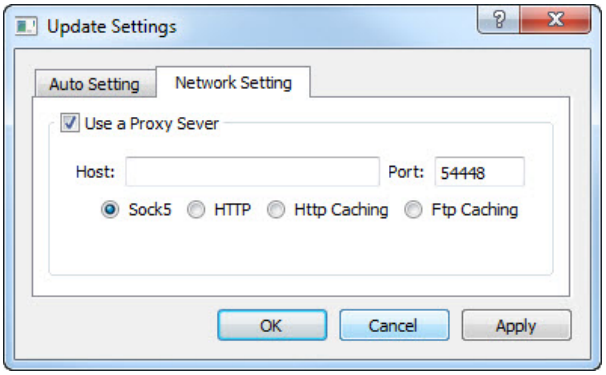
Changing the Network Setting

To enable automatic checking, you must indicate how your computer accesses the Internet.

To change the Internet connection settings:

1. Select the **Network Setting** tab of the Update Settings dialog box, shown in Figure 5.

Figure 5: Network Settings Tab of the Update Settings Dialog Box



2. Select the **Use a Proxy Server** option if you must go through a proxy server before connecting to the Internet. The proxy server prevents outsiders from breaking into your organization's private network. Ask your system administrator for the URL address and port assignment. This option is turned on by default.

   If you use direct Internet access, do not select the **Use a Proxy Server** option on this tab.

Installing Updates

When you use the Auto Check feature, UPDATE notifies you whenever an update version of Diamond becomes available. You receive notification when you open the Diamond main window.

To check and install the recommended update:

- Click **Update**. The UPDATE software goes online to check for an update. If one is available, the Diamond update version will be displayed in the **Available update versions** field.
- Click **Download** to save the update to a directory and install it later.
- Click **Install** to download and install the selected update version (as the version number specified in the **Available update versions** field) right away.

To install a downloaded update:

1. Close all Diamond tools.
2. Go to the location where you saved the update version.
3. Double-click the update file and follow the on-screen instructions.

Installing Stand-Alone Programmer

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

- Programmer
- Deployment Tool
- Download Debugger
- Programming File Utility
- Model 300 Programmer
- Install & Uninstall Cable Drivers

If you want to use Programmer, Deployment Tool, Download Debugger, Programming File Utility, or Model 300 Programmer without installing Lattice Diamond, you can install the stand-alone Programmer.

The stand-alone Programmer is available in 64-bit versions.

- The 64-bit version of stand-alone Programmer is optimized to run on Windows 64-bit systems.

Follow the product download instructions and uncompress the software. For more information on how to download stand-alone Programmer, go to http://www.latticesemi.com/latticediamond and 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.

To install the stand-alone Programmer:

1. Close all applications before starting installation.
2. Double-click on the Programmer installer you downloaded to launch the installation process.
3. The Welcome To Lattice Diamond Programmer setup dialog box opens.
4. Click **Next** to open the License Agreement dialog box.
5. Read the license agreement. If you agree, click **I Accept the terms of the License Agreement** and then click **Next** to open the Choose Destination Location dialog box.
6. The default destination folder is C:\lscc. Click **Browse** to change the drive or destination folder.
7. Click **Next**. The default name of the program group is **Lattice Diamond Programmer 3.14**. If you want to change the name, change it in the Program Folder text box.
8. Click **Next** to open the Select Features dialog box. Your choices are:
   - Lattice Diamond Programmer Components

- Programmer Drivers

Note

The first time the FTDI driver is installed, the Windows operating system may report that Windows can't verify the publisher of this driver software. Select “Install this driver software anyway.” This warning will not occur on subsequent installations.

Choose the desired features.

9. Click **Next** to start installing the selected components.
10. In the InstallShield Wizard Complete dialog box, read the note and click **Finish**.

Starting Stand-Alone Programmer

To start the stand-alone Programmer:

- Choose **Apps > Lattice Diamond Programmer 3.14 > Programmer**.

Starting Stand-Alone Deployment Tool

To start the stand-alone Deployment Tool:

- Choose **Apps > Lattice Diamond Programmer 3.14 > Deployment Tool**.

Starting Stand-Alone Download Debugger3.14

To start the stand-alone Download Debugger:

- Choose **Apps > Programs > Lattice Diamond Programmer 3.14 > Download Debugger**.

Starting Stand-Alone Programming File Utility

To start the stand-alone Programming File Utility:

- Choose **Apps > Lattice Diamond Programmer 3.14 > Programming File Utility**.

Starting Stand-Alone Model 300 Programmer

To start the stand-alone Model 300 Programmer:

- Choose **Apps > Lattice Diamond Programmer 3.14 > Model 300 Programmer**.

Installing Stand-Alone Reveal Logic Analyzer

Reveal Logic Analyzer is included in the Diamond installation. If you want to use the tool without installing Lattice Diamond, first download it from the Lattice Semiconductor Web site.

Reveal Logic Analyzer is available in 64-bit versions.

- The 64-bit version of Reveal Logic Analyzer is optimized to run on Windows 64-bit systems.

For more information on how to download stand-alone Reveal Logic Analyzer, go to http://www.latticesemi.com/latticediamond and 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.

To install the stand-alone Reveal Logic Analyzer:

1. Close all applications before starting installation.
2. Double-click on the Reveal installer you downloaded to launch the installation process.
3. The Welcome To Lattice Diamond Reveal Analyzer setup dialog box opens.
4. Click **Next** to open the License Agreement dialog box.
5. Read the license agreement. If you agree, click **I Accept the terms of the License Agreement** and then click **Next** to open the Choose Destination Location dialog box.

6. The default destination folder is C:\lscc. Click **Browse** to change the drive or destination folder.
7. Click **Next**. The default name of the program group is **Lattice Diamond Reveal 3.14**. If you want to change the name, change it in the Program Folder text box.
8. Click **Next** to open the Select Features dialog box. Your choices are:
   - Lattice Diamond Reveal Logic Analyzer Components
   - Lattice Diamond Programmer Components
   - Programmer Drivers

   Note

   The first time the FTDI driver is installed, the Windows operating system may report that Windows can't verify the publisher of this driver software. Select “Install this driver software anyway.” This warning will not occur on subsequent installations.

   Choose the desired features.
9. Click **Next** to start installing the selected components.
10. In the InstallShield Wizard Complete dialog box, read the note and click **Finish.**

Starting Stand-Alone Reveal Logic Analyzer

To start the stand-alone Reveal Logic Analyzer:

- Choose **Apps > Lattice Diamond Reveal 3.14 > Reveal Logic Analyzer**.

Installing Stand-Alone Power Estimator

Power Calculator is included in the Diamond installation. If you want to use the tool without installing Lattice Diamond, you can install the stand-alone Power Estimator, available for download from the Lattice Semiconductor Web site.

Power Estimator is available in 64-bit versions.

- The 64-bit version of Power Estimator is optimized to run on Windows 64-bit systems.

For more information on how to download stand-alone Power Estimator, go to http://www.latticesemi.com/latticediamond and 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.

To install the stand-alone Power Estimator:

1. Close all applications before starting installation.
2. Double-click on the Power Estimator installer you downloaded to launch the installation process.
3. The Welcome To Lattice Diamond Power Estimator setup dialog box opens.
4. Click **Next** to open the License Agreement dialog box.
5. Read the license agreement. If you agree, click **I Accept the terms of the License Agreement** and then click **Next** to open the Choose Destination Location dialog box.
6. The default destination folder is C:\lscc. Click **Browse** to change the drive or destination folder.
7. Click **Next**. The default name of the program group is **Lattice Diamond Power Estimator 3.14**. If you want to change the name, change it in the Program Folder text box.
8. Click **Next** to open the Select Features dialog box. Your choices are:
   - Diamond Power Estimator Components
9. Click **Next** to start installing the selected components.
10. In the InstallShield Wizard Complete dialog box, read the note and click **Finish.**

Starting Stand-Alone Power Estimator

- Choose **Apps > Lattice Diamond Power Estimator 3.14 > Diamond Power Estimator**.

Note

The stand-alone Power Estimator requires a license. See “Licensing for Diamond and Stand-Alone Power Estimator” on page 12.

Troubleshooting

If you encounter any software-related problems after installing Diamond, review the following common troubleshooting scenarios before calling Lattice Semiconductor Technical Support:

- Ensure that your environment variable settings are set correctly, including the TEMP user variable.
- Your should also have the following system environment setting pointing to the license file:

  `SET LM_LICENSE_FILE=<Lattice_license_path>\license.dat`

If you have multiple installations of Lattice software, this variable may have multiple paths in it. If there are problems, you may need to manually edit the variable.

You can verify these settings by accessing the System Properties dialog box from your Windows system. Select the Advanced tab from that dialog box and go to the “Environment Variables” section.

- If you have problems with the display, ensure that your system video display is set to a screen resolution of 1024 x 768 or more and that your video display is set to use 256 or more screen colors.
- If Diamond is installed on a Windows 7 or Windows 8/8.1 or Windows 10 system with administrator privilege and is to be used by an account in the “Users” group, make sure that the user account has permission to write the following folder and the configuration file in that folder:

  `<boot_drive>:\users\<login_name>\AppData\Roaming\LatticeSemi\*.ini`

- Opening the online Help may be interrupted by one of the following messages on the Internet Explorer Information Bar:
  - “To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer. Click here for options...”
  - “To help protect your security, Internet Explorer has restricted this file from running scripts or ActiveX controls that could access your computer. Click here for options...”
  - “To help protect your security, Internet Explorer has restricted this webpage from running scripts or ActiveX controls that could access your computer. Click here for options...”

  This can happen if you have Internet Explorer as your default browser.

  To see the Help, click on the Information Bar and choose **Allow Blocked Content**. A dialog box with an expanded warning opens. Click **Yes**.

  To avoid these warnings, either use a different browser or turn off the warning for active content in Internet Explorer.

Note

Doing either of these means that when you open any Web page that is resident on your computer—not just Diamond Help—the page will automatically run any active content that it has. While active content is common and can be very useful, malicious content can damage your files. Be sure you trust the software on your computer.

If new license is not recognize by the software, kindly check windows registry and search for LM_LICENSE_FILE variable. Update the path to include new license and/or remove old license paths.

To turn off the warning:

a. In the Internet Explorer, choose **Tools > Internet Options**.

b. Click the **Advanced** tab.

c. Under Security, select **Allow active content to run in files on My Computer**.

d. Click **OK**.

When All Else Fails

If Diamond still does not run after you have installed your new license file and confirmed that your environment variables are correct, gather the following items:

- A screen capture showing the error message
- A text file that contains a listing of the environment setup for your PC. From an MS-DOS Prompt window, issue the **set > env.txt** command.
- Your license.dat file

Put these items into a zip file and submit a technical support case, including an explanation of the problem.

Installing LatticeMico Development Tools

LatticeMico Development Tools is included in the Diamond installation option now. You can select it when installing Lattice Diamond. If you want to use the tool without installing Lattice Diamond, first download it from the http://www.latticesemi.com/latticediamond

- If the 3.14 version of Diamond is installed on your computer, the LatticeMico Development Tools will be installed by default in a folder called micosystem, which resides in the folder in which Diamond was installed. For example, the LatticeMico Development Tools could be installed in the <*install_drive*>:\lscc\diamond\3.14\micosystem directory. Users designing with Platform Manager 2 devices must install LatticeMico System with Diamond in order to make the Diamond Platform Designer software functional.
- If the 3.14 version of Diamond is not installed on your computer, the LatticeMico Development Tools will be installed by default in a folder called micosystem, which resides in the LatticeMico folder. For example, the LatticeMico Development Tools could be installed in the <*install_drive*>:\LatticeMicoSystem directory.

Whether you install LatticeMico Development Tools with Diamond or as stand-alone tools, you can download them from the Lattice Semiconductor Web site.

Installing LatticeMico with 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.

See “Installing Diamond 3.14 for Windows” on page 8 for detailed instructions on installing Diamond.

Note

The LatticeMico software works with both 32-bit and 64-bit Windows systems.

The LatticeMico software is available for download from the Lattice Semiconductor Web site. For more information on how to download the LatticeMico software, go to http://www.latticesemi.com/latticediamond and 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.

Note

If you do not have Lattice Diamond installed, you can install the LatticeMico Development Tools as stand-alone tools. For information on this procedure, see “Installing LatticeMico as Stand-Alone Software” on page 31.

Starting LatticeMico Development Tools

To start the LatticeMico Development Tools if you have installed LatticeMico System within the Lattice Diamond 3.14 software:

- Choose **Apps > Lattice Diamond 3.14 > Accessories > LMS 1.2 for Diamond 3.14** from the Windows Start menu.

To start the LatticeMico Development Tools as stand-alone software:

- Choose **Apps > Lattice Diamond 3.14 > LMS 1.2 for Diamond 3.14**.

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.
8/29/2023	3.13	Updated to reflect changes in Diamond 3.13.