Licensing User Guide for Linux

October 10, 2025

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

Chapter 1

Lattice Development Tools

Device Support and Licensing

Lattice design tools are built to help you keep innovating. Whether you are designing high-volume mobile handsets or leading-edge telecom infrastructure, our easy-to-use tools will help you bring your ideas to market faster - ahead of your competition.

Lattice Radiant Software

Full-featured FPGA design suite offering best-in-class tools for small form factor FPGA applications. Powerful yet intuitive tools provide fast design starts and precise implementation with intelligent planning and accurate analysis.

To see supported devices, go to the Lattice Software Licensing page.

Lattice Diamond Software

Leading edge design software for Lattice FPGA families. Upgrade your design process with an easy-to-use interface, superior design exploration, optimized design flow, Tcl scripting, and more.

To see supported devices, go to the Lattice Software Licensing page.

Lattice Propel Design Environment

Lattice Propel is a complete set of graphical and command-line tools to create, analyze, compile, and debug both FPGA-based processor system hardware and software design.

To see supported devices, go to the Lattice Software Licensing page.

ispLEVER Classic Software

ispLEVER Classic is the design environment for Lattice CPLDs and mature programmable products. It can be used to take a Lattice device design completely through the design process, from concept to device JEDEC or Bitstream programming file output.

Supported FPGA

- ispMACH 4000
- ispMACH 4A3
- ispMACH 4A5
- ispMach 5000VG
- ispGDX
- ispGDX2
- ispLSI 1K

- ispLSI 2K
- ispLSI 5000VG
- ispXPGA-E

iCEcube2 Design Software

Easy-to-use design tools to help you hit your cost, power, and time-to-market targets. iCEcube2 design software supports the iCE40 family of ultra-low-density FPGAs.

Supported FPGA

- iCE40 UltraPlus
- iCE40 LP/HX/LM
- iCE40 Ultra/UltraLite

Chapter 2

Licensing Overview

Introduction to Lattice Design Tools Licensing

Lattice Design Tools require a license to utilize the software. This comes into two categories: Free and Subscription Licenses.

Free Tools licenses permit access to certain devices with the full bitstream. With Radiant, you can still generate bitstream with a free license using Evaluation Mode for certain devices.

Table 1: Device Support Per Design Flow

Device Support	Radiant Free License			
	Synthesize	**Map**	**Place & Route**	**Bitstream**
Avant-AT-E	✓	✓	✓	Not Available*
Avant-AT-G	✓	✓	✓	Not Available*
Avant-AT-X	✓	✓	✓	Not Available*
Certus-N2	✓	✓	✓	Evaluation Mode*
CrossLinkU-NX	✓	✓	✓	Evaluation Mode**
MachXO5-NX	✓	✓	✓	Evaluation Mode**
CertusPro-NX	✓	✓	✓	Evaluation Mode**
Certus-NX	✓	✓	✓	✓
CrossLink-NX	✓	✓	✓	✓
CertusPro-NX-RT	✓	✓	✓	Evaluation Mode**
Certus-NX-RT	✓	✓	✓	Evaluation Mode**
iCE40 UltraPlus	✓	✓	✓	✓
Device Support	**Diamond Free License**			
	Synthesize	**Map**	**Place & Route**	**Bitstream**
ECP5UM, ECP5UM5G	✓	✓	✓	Not Available*
LatticeECP3	✓	✓	✓	Not Available*

Table 1: Device Support Per Design Flow (Continued)

Device Support	Diamond Free License			
	Synthesize	Map	Place & Route	Bitstream
LatticeECP2M/S, LatticeECP2/S	✓	✓	✓	Not Available*
LatticeSC, LatticeSCM	✓	✓	✓	Not Available*
Crosslink, CrosslinkPlus	✓	✓	✓	✓
ECP5U	✓	✓	✓	✓
LatticeECP2, LatticeEC	✓	✓	✓	✓
MachXO3D, MachXO3L/LF	✓	✓	✓	✓
MachXO2, MachXO	✓	✓	✓	✓
LatticeXP2, LatticeXP	✓	✓	✓	✓
Platform Manager 2, Platform Manager	✓	✓	✓	✓
Mach-NX	✓	✓	✓	✓

Note:

*You need a subscription license to enable full bitstream capability.

**Enables a 4-hour hardware timer. You need a subscription license to remove this and have full access to the bitstream.

Please visit the Lattice online store.

How to use this Guide

This installation guide is authored for Client Machines and License Administrators.

Floating License Installation

- For License Administrators who set up company servers and client licenses, please refer to the Server section.
- For Clients who access the server license, please refer to the Client section to set up the local client license.

Chapter 3

Licensing Basics

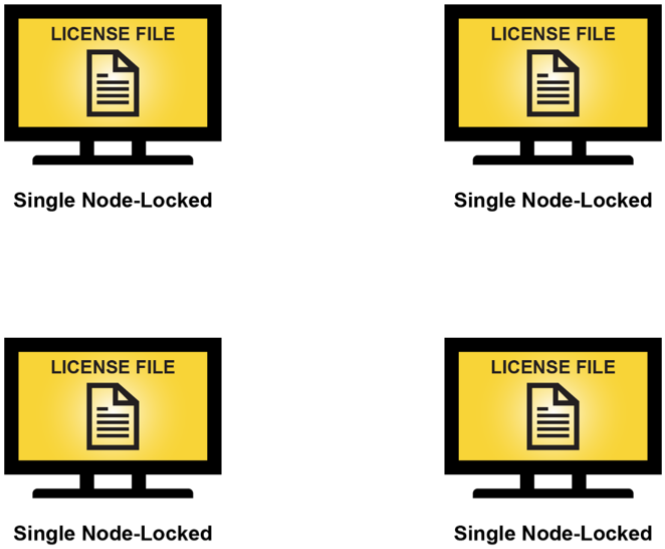
License Types

There are two license categories for Lattice Tools: **Node-locked and Floating**.

Node-locked License

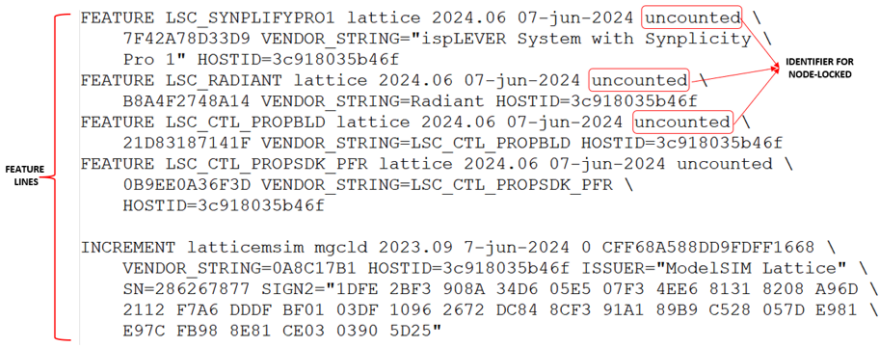
A node-locked license is confined to use on one specific machine only. The license is uncounted, which means that if software is operating on a particular machine, there is no limit on the number of instances permitted to run.

Node-locked License: 4 Machines = 4 Licenses



Software ***limited*** to single machine

Free Node-locked License




```
FEATURE LSC_SYNPLIFYPRO1 lattice 2024.06 07-jun-2024 uncounted \
    7F42A78D33D9 VENDOR_STRING="ispLEVER System with Synplicity \
    Pro 1" HOSTID=3c918035b46f
FEATURE LSC_RADIANT lattice 2024.06 07-jun-2024 uncounted \
    B8A4F2748A14 VENDOR_STRING=Radiant HOSTID=3c918035b46f
FEATURE LSC_CTL_PROPBLD lattice 2024.06 07-jun-2024 uncounted \
    21D83187141F VENDOR_STRING=LSC_CTL_PROPBLD HOSTID=3c918035b46f
FEATURE LSC_CTL_PROPSDK_PFR lattice 2024.06 07-jun-2024 uncounted \
    0B9EE0A36F3D VENDOR_STRING=LSC_CTL_PROPSDK_PFR \
    HOSTID=3c918035b46f

INCREMENT latticemsim mgcld 2023.09 7-jun-2024 0 CFF68A588DD9FDFF1668 \
    VENDOR_STRING=0A8C17B1 HOSTID=3c918035b46f ISSUER="ModelSIM Lattice" \
    SN=286267877 SIGN2="1DFE 2BF3 908A 34D6 05E5 07F3 4EE6 8131 8208 A96D \
    2112 F7A6 DDDF BF01 03DF 1096 2672 DC84 8CF3 91A1 89B9 C528 057D E981 \
    E97C FB98 8E81 CE03 0390 5D25"
```

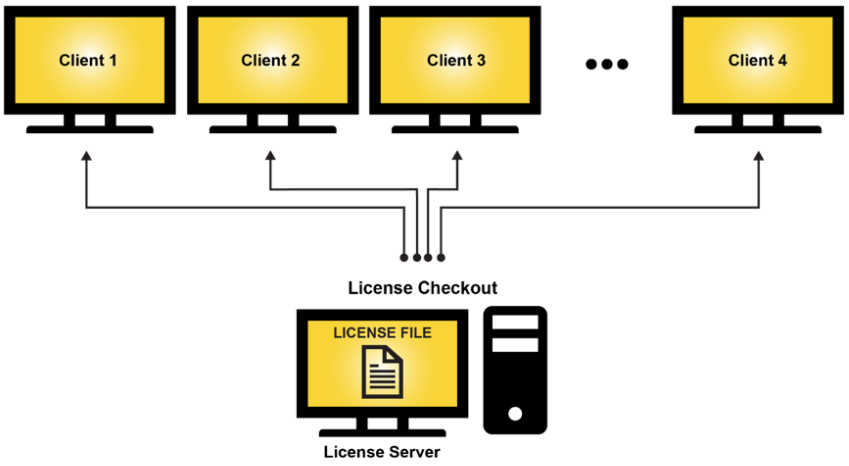
Subscription Node-locked License


```
| ATTENTION:  The vertical bar "|" indicates the information after
|             it is a comment.

| Dear Customer:

| Your license file is included below.
|
| The license feature lines in this file MUST remain intact and
| without modification or software will not operate.
|
| For quick-start installation, please refer to the licensing information in the
| email body when you received this license file as attachment.
|
| Edit your autoexec.bat OR Environment Variables to point to the
| proper file. For example: LM_LICENSE_FILE C:\lscc\diamond\3.11_x64\license\license.dat;
|
| NOTE:  Feature lines will wrap to the next line.  If you want to enter a line
| feed at the end of the first line, a space and a backslash "\" are
| required at the end of that line.

|BEGIN
|Company Name   :Lattice Semiconductor Manila
|Designer Fname  :
|Designer Lname  :
|Company Address :11/F Aeon Centre Lot 2-3 Blk 45 Filinvest Ctr. Alabang Zapote Road cor.
|Company Address :
|Company Address :
|Company City    :Manila
|Company State   :
|Company Zipcode :
|Company Country :Philippines
|Company Phone   :
|Company Fax     :
|E Mail Address  :lic_admn@latticesemi.com
|SW Part Number  :LSC-SW-RADIANT-NL
|License Type      :Node Locked
|Seats             :1
|KEY S/N          :112522TEST01
|KEY_ID           :1234ABCD56EF
INCREMENT latticemsim mgcld 2023.09 1-dec-2023 0 FF25361112F4BF7D2A25 \
    VENDOR_STRING=FC7A8721 HOSTID=1234abcd56ef ISSUER="ModelSIM Lattice" \
    SN=283494339 SIGN2="1984 E9A9 7DA1 18B0 91B0 1184 7278 3676 B65F CE51 \
    F929 EDF9 3A22 AD20 D74E 04C1 497F B559 23DE F9E4 B10B 1F7E B2F3 73FD \
    819F E01D D606 4D17 5750 E23A"


FEATURE LSC_SYNPLIFYPRO1 lattice 2023.12 01-dec-2023 uncounted \
    C5A64C557118 VENDOR_STRING=LSC_SYNPLIFYPRO1 \
    HOSTID=1234abcd56ef

FEATURE LSC_RADIANT_SUBSCRIPTION lattice 2023.12 01-dec-2023 \
    uncounted EE7B5D827711 VENDOR_STRING=LSC_RADIANT_SUBSCRIPTION \
    HOSTID=1234abcd56ef

FEATURE LSC_RADIANT lattice 2023.12 01-dec-2023 uncounted \
    425FD3047DB3 VENDOR_STRING=LSC_RADIANT HOSTID=1234abcd56ef
```

Floating License

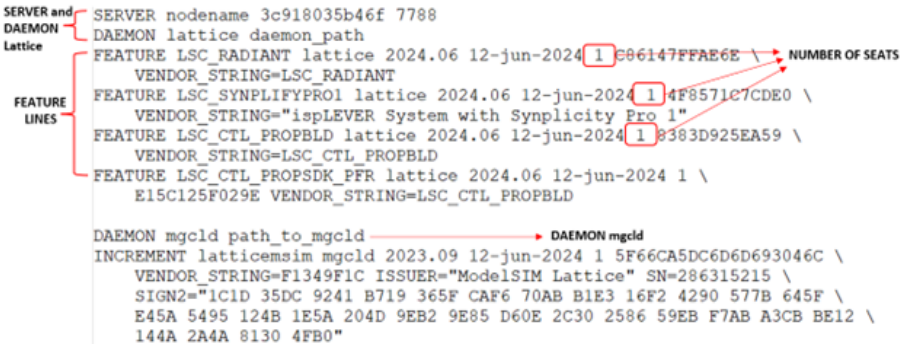
A floating license allows multiple clients to check out individual features concurrently from a shared license server. Floating licenses require the correct license server information and daemon location. Floating licenses are limited to the number of features seats specified in the license.

Floating License: No of seats — No of machines with access



Software ***available*** to entire network

Free Floating License




```
SERVER nodename 3c918035b46f 7788
DAEMON lattice daemon_path
FEATURE LSC_RADIANT lattice 2024.06 12-jun-2024 1 C06147FFAE6E \
    VENDOR_STRING=LSC_RADIANT
FEATURE LSC_SYNPLIFYPRO1 lattice 2024.06 12-jun-2024 1 4F8571C7CDE0 \
    VENDOR_STRING="ispLEVER System with Synplicity Pro 1"
FEATURE LSC_CTL_PROPBLD lattice 2024.06 12-jun-2024 1 8383D925EA59 \
    VENDOR_STRING=LSC_CTL_PROPBLD
FEATURE LSC_CTL_PROPSDK_PFR lattice 2024.06 12-jun-2024 1 \
    E15C125F029E VENDOR_STRING=LSC_CTL_PROPBLD

DAEMON mgcld path_to_mgcld
INCREMENT latticemsim mgcld 2023.09 12-jun-2024 1 5F66CA5DC6D6D693046C \
    VENDOR_STRING=F1349F1C ISSUER="ModelSIM Lattice" SN=286315215 \
    SIGN2="1C1D 35DC 9241 B719 365F CAF6 70AB B1E3 16F2 4290 577B 645F \
    E45A 5495 124B 1E5A 204D 9EB2 9E85 D60E 2C30 2586 59EB F7AB A3CB BE12 \
    144A 2A4A 8130 4FB0"
```

Subscription Floating License


```
| ATTENTION:  The vertical bar "|" indicates the information after
|             it is a comment.

| Dear Customer:

| Your license file is included below.
|
| The license feature lines in this file MUST remain intact and
| without modification or software will not operate.
|
| For quick-start installation, please refer to the licensing information in the
| email body when you received this license file as attachment.
|
| Edit your autoexec.bat OR Environment Variables to point to the
| proper file. For example: LM_LICENSE_FILE C:\lscc\diamond\3.11_x64\license\license.dat;
|
| NOTE:  Feature lines will wrap to the next line.  If you want to enter a line
| feed at the end of the first line, a space and a backslash "\" are
| required at the end of that line.

|BEGIN
|Company Name   :Lattice Semiconductor Manila
|Designer Fname  :
|Designer Lname  :
|Company Address :11/F Aeon Centre Lot 2-3 Blk 45 Filinvest Ctr. Alabang Zapote Road cor.
|Company Address :
|Company Address :
|Company City    :Manila
|Company State   :
|Company Zipcode :
|Company Country :Philippines
|Company Phone   :
|Company Fax     :
|E Mail Address  :lic_admn@latticesemi.com
|SW Part Number  :LSC-SW-RADIANT-FL
|License Type      :Floating
|Seats             :1
|KEY S/N          :090722INT05
|KEY_ID           :3C918035B46F
SERVER nodename 3C918035B46F 7788
DAEMON lattice daemon_path
DAEMON mgcld path_to_mgcld
INCREMENT latticemsim mgcld 2023.09 13-jun-2024 1 FFB63A0D48A9DB889574 \
    VENDOR_STRING=C0076DD4 ISSUER="ModelSIM Lattice" SN=286315223 \
    SIGN2="1BD1 6C48 A73D 5FFA 4C4D 5A21 8201 3DF4 9FF7 B930 6290 B2D4 \
    2937 4F43 C9E9 1235 04BC 3A04 410C 86EC 36B5 B476 E40C 33DB 6363 A1A7 \
    60D6 A13C 53DA F7EC TS_OK
FEATURE LSC_SYNPLIFYPRO1 lattice 2024.06 13-jun-2024 1 589AFD7D9039 \
    VENDOR_STRING=LSC_SYNPLIFYPRO1 user_info=Trisha.Rubio@latticesemi.com TS_OK
FEATURE LSC_RADIANT_SUBSCRIPTION lattice 2024.06 13-jun-2024 1 \
    4DCE473A934D VENDOR_STRING=LSC_RADIANT_SUBSCRIPTION user_info=Trisha.Rubio@latticesemi.com TS_OK
FEATURE LSC_RADIANT lattice 2024.06 13-jun-2024 1 C97847FEAE6E \
    VENDOR_STRING=LSC_RADIANT user_info=Trisha.Rubio@latticesemi.com TS_OK
```

FEATURE vs. INCREMENT in a Floating License

INCREMENT

Increment are additive lines in which a series of lines result in the sum of all the seats.

Increment lines: 1+4 = Total of 5 licenses

```
INCREMENT latticemsim mgcld 2023.09 25-mar-2024 1 3F96F5C91783315ADF7B \
    VENDOR_STRING=7D06295E ISSUER="ModelSIM Lattice" SN=285454249 \

INCREMENT latticemsim mgcld 2023.09 25-mar-2024 4 3F96F5C91783315ADF7B \
    VENDOR_STRING=7D06295E ISSUER="ModelSIM Lattice" SN=285454249 \
```

FEATURE

Feature lines are not additive in which only the **first feature** line will be taken into consideration in a license file.

Feature lines: Move the 4-seat license FEATURE line to the top of the license if 4 concurrent users are needed

```
FEATURE LSC_RADIANT lattice 2024.03 25-mar-2024 1 191937CDF4B1 \
    VENDOR_STRING=LSC_RADIANT

FEATURE LSC_RADIANT lattice 2024.03 25-mar-2024 4 191937CDF4B1 \
    VENDOR_STRING=LSC_RADIANT
```

VERSION vs. EXPIRATION DATE in a License

VERSION

The Maintenance Version covers the latest valid tool version. It needs to be greater than the software version to run the tools.

```
INCREMENT latticemsim mgcld 2023.09 25-mar-2024 4 3F96F5C91783315ADF7B \
    VENDOR_STRING=7D06295E ISSUER="ModelSIM Lattice" SN=285454249 \
```

EXPIRATION DATE

The License Expiration Date specifies the last day that the license is valid.

After March 25, 2024, this FEATURE line is no longer valid

```
FEATURE LSC_RADIANT_SUBSCRIPTION lattice 2024.03 25-mar-2024 1 \
    B0F016E4F29A VENDOR_STRING=LSC_RADIANT_SUBSCRIPTION
```

How to Obtain a License

Free Licenses

Lattice offers free licenses which enable you to design and evaluate the performance of the supported devices per Software tool. To request free software licenses, see the links below. For other Software Tools, please go to the Software Licensing page.

Radiant Free License

The free license enables full design and implementation functionality for Radiant-supported devices.

- Request Node-locked License
- Request Floating License

Diamond Free License

The free license enables you to design and evaluate the performance of non-SERDES-based Diamond-supported devices.

- Request Node-locked License
- Request Floating License

Subscription Licenses

Subscription licenses enable you to design and optimize solutions for supported devices in each Software tool. To purchase or renew a Software license, please go to the Online Store or contact a local sales representative or distributor.

If you have purchased a Software license and received a Software Serial Number, please go to our Subscription licensing form to generate the required license.

Software Evaluation License

Explore our powerful Software Tools crafted to enhance your productivity and enjoy the seamless integration and an intuitive interface that elevates your design process. Experience the complete suite of any of the Lattice Software Tools features for 60-days. Click Request Evaluation License to get started.

Done with the evaluation? Purchase the full subscription license in our Online Store or contact a local sales representative or distributor.

Subscription License 30-Day Extension

If you need a temporary license extension while license renewal is being processed, we have a solution for this scenario.

This license is only for a temporary extension to a subscription license that will expire.

To request an extension, you will need the following:

- Your subscription license serial number
- Click **Request an extension** and go to **My Licenses** to edit the record and click **Extend 30 days**.
- If you have not previously connected to our support portal, you will need to verify your contact information.

How to determine the MAC address/NIC ID

The Network Interface Card ID uniquely identifies your workstation on the network. There are two ways to determine your MAC Address:

1. In a terminal window, type **ifconfig -a** and press return.

   In the list of interfaces, find **eth0**.

   Locate the number next to **HWAddr**.

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

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

How to Fill in the Licensing Forms

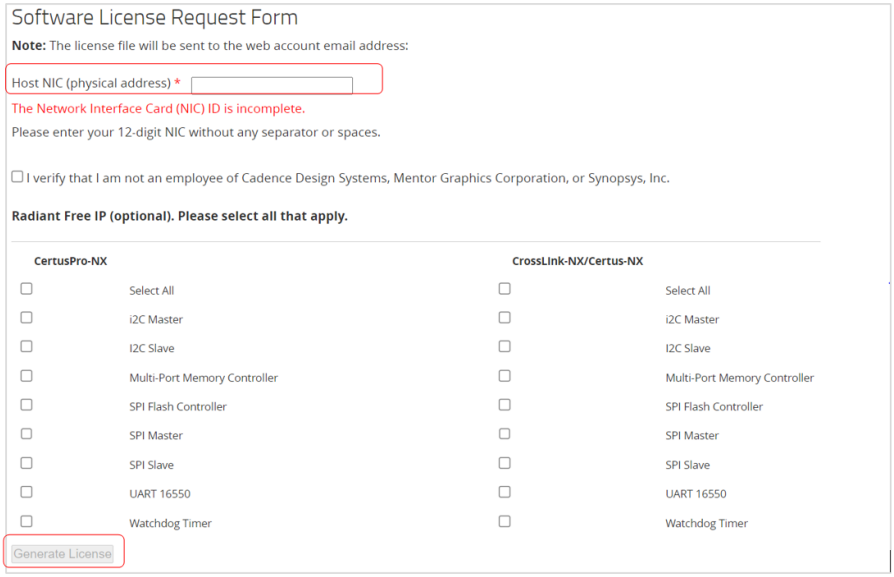
Free Web Licenses

You may generate free web licenses for certain devices that are supported by Lattice Software Tools.

To fill in the Software Licensing Request Form

1. Ensure that you enter your NIC ID without any separator or spaces.
2. Proceed to check the tick box verifying that you are not an employee of Cadence Design Systems, Mentor Graphics Corporation, or Synopsys, Inc.
3. You may choose to include some Free IPs listed and click generate.

Free License Software Licensing Form



Subscription Licenses

If you have purchased a Software license and received a Software Serial Number, you will be directed to our Subscription licensing form where you will need:

- A latticesemi.com account.

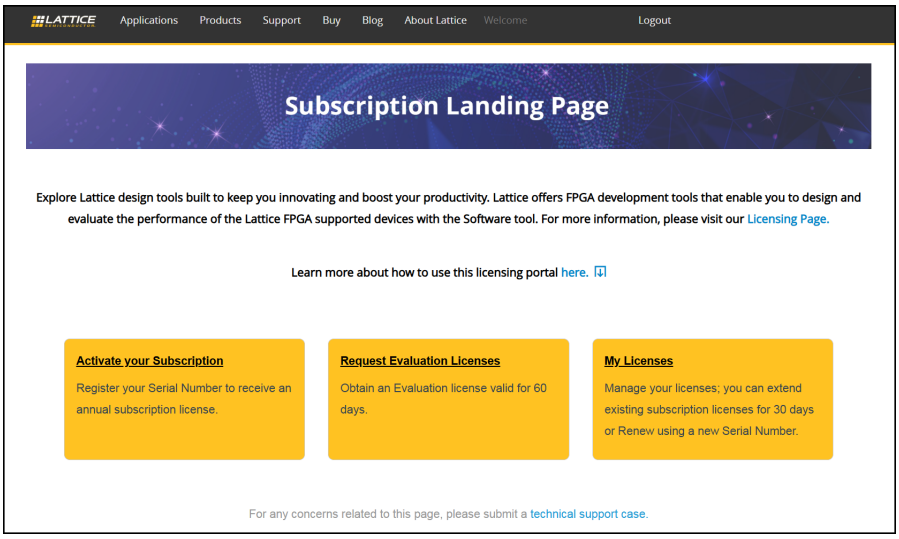
  It is recommended to create an account if you do not already have one yet.
- The given serial number.

Note:

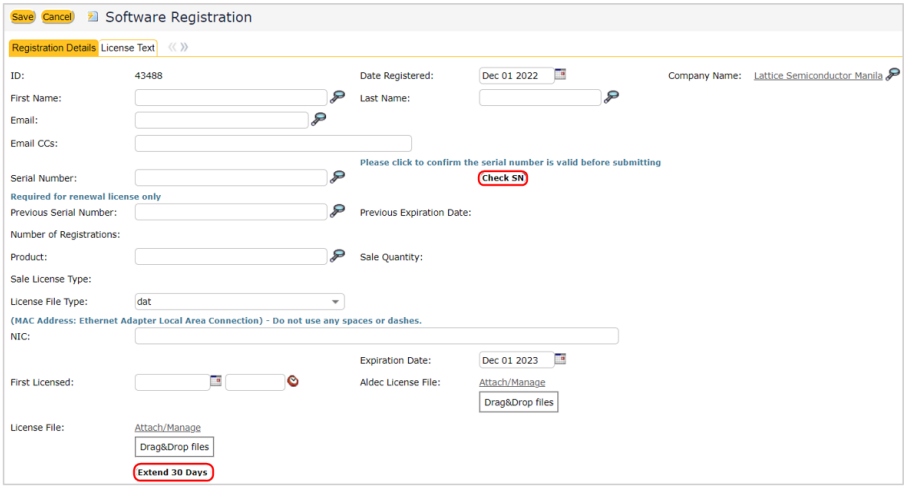
Click **Check SN** to check if the serial number is available to license.

- The NIC/Physical address of the computer you wish to license.
- Company Name

Subscription Licensing Page



Subscription Licensing Form



Evaluation Licenses

Lattice offers evaluation license to enable free subscription license for end users up to 60 days. You may request an evaluation license from the subscription licensing self-service portal.

Academic License Program

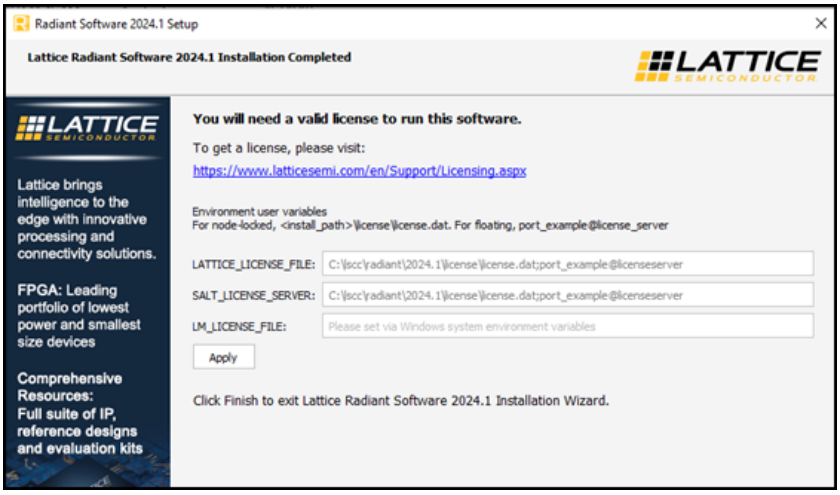
We offer a 1-year Lattice Design tools license free for colleges and universities who meet our academic license program requirements. If you are a professor, and you are interested in applying, please login to your Lattice account and fill out the application form here. If you are a student, please coordinate with your professor to join this program.

Chapter 4

License Installation

To fully utilize the Lattice Software Design Tools, Software Licenses must be installed properly. The process depends on the type of license you are to use.

With Radiant 2024.1 and newer versions, you have the option to set the environment variable at the end of installation.



LM_LICENSE_FILE – generic environment variable that is a standard FlexLM variable used by many software tools to locate the license file or license server. It can be overridden by the LATTICE_LICENSE_FILE environment variable. This is the variable that needs to be setup and is used across this user guide.

LATTICE_LICENSE_FILE – environment variable used by Lattice Semiconductor tools (such as Radiant, Diamond, Propel) to specify the path to the license file required for tool activation.

SALT_LICENSE_SERVER – environment variable by Siemens Advanced Licensing Technology (SALT)-based applications. It defines the location of the license file or license server used to validate floating or node-locked licenses.

SALT_LICENSE_SERVER and LATTICE_LICENSE_FILE are used only to supersede or in absence of LM_LICENSE_FILE

Node-locked License Installation

1. You will receive a license email once the license has been generated. Save the attached file (**license_.dat**) to the installation folder of your software product (**e.g. <sw_install>\license\license.dat**).
2. Set up the license as follows:

   If your license.dat file is not under <install_path>/2022.1/license, you must set the LM_LICENSE_FILE variable to the location of your license file. For example:

   If you are using CSH, set the variable to:

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

   If you are using BASH, set the variable to:

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

3. Run the Radiant software executable file in the command line as follows:

   ```
   % <install_path>/bin/lin64/radiant &
   ```

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

   To invoke stand-alone Reveal Analyzer, run:

   ```
   % revealrva
   ```

Floating License Installation

Server

To enable a floating license, you must have a license server set up on a Windows or Linux server to monitor your Radiant software license. Each client PC must have the LM_LICENSE_FILE variable set to point to the license file on the server.

To edit the License File:

After obtaining a floating license from Lattice Semiconductor, you must edit the license file to specify the server's name and the paths to the Lattice daemon.

1. 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.

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

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

3. Edit the **QuestaSim DAEMON** line, replacing path_to_mgcld or path_to_satld with the path to:

   QuestaSim Lattice Edition. For QuestaSim, the path is:

   ```
   % <install_path>/radiant/<version>/questasim/license_server/
   saltd.exe
   ```

   saltd supports mgcld as well.

   For version older than 2024.1 with only ModelSim, edit the ModelSim DAEMON line, replacing path_to_mgcld to:

   ```
   <install_path>/radiant/<version>/modeltech/
   win32loem/mgcld
   ```

Floating license before editing.

```
SERVER nodename bcaec5d7e446 7788
DAEMON lattice daemon_path

DAEMON saltd path_to_saltd
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"
```

Floating license after editing

```
SERVER LMN10812 bcaec5d7e446 7788
DAEMON lattice C:\lscc\radiant\2024.1\ispfpga\bin\nt64\lattice.exe

DAEMON saltd C:\lscc\radiant\2024.1\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"
```

To start the License Manager:

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

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

To stop the License Manager:

If it is necessary to stop the FLEXlm license manager, you may 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>/ispfpga/bin/lin64/lmutil lmdown -c
   <install_path>/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.

To install and run the License Manager on a Remote Server:

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

1. Copy the files lattice, lmgrd, and lmutil from the following directory:

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

2. You can also install it to your desired location. For example:

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

To start 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>/license/license.log
  -c <install_path>/license/license.dat
  ```

To stop the License Manager on a Remote Server:

If it is necessary to stop the FLEXlm license manager running on a remote server, you may 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>/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.

Client

In this configuration, the software tool is installed on your license server (for license manager utilities and daemons) and on each client that uses the software tool. This configuration gives the best run-time performance. After you receive your floating license and ensure that the license manager is running, install the software locally on each client that will use the floating license.

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/ubuntu_host_name**.

If you are using CSH, set the environment variable to:

```
% setenv LM_LICENSE_FILE $LM_LICENSE_FILE (/
<license_port_number@linux/ubuntu_host_name )
```

If you are using BASH, set the environment variable to:

```
% export LM_LICENSE_FILE=$LM_LICENSE_FILE:/
< license_port_number@linux/ubuntu_host_name
```

Installing System Library Packages to Set up Floating License Server

If the dynamic linker/loader ld-lsb-x86-64 cannot be found, it is an indication that LSB packages are missing.

Installing System Library Package on Red Hat 64-bit Operating System Manually

If you want to manually install the system library package, use the following command:

```
sudo yum install redhat-lsb
```

Installing System Library package on Ubuntu 64-bit Operating System Manually

If you want to manually install the system library package, use the following command:

```
sudo apt-get install lsb-core
```

Checking the License File with lmutil

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

<install_path>/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 example shows the usage of 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 Radiant Software from the Command Line

There are two ways to run the Radiant software from the command line:

- Through Radiant Tcl Console.
- By running executable files directly.

Running Stand-Alone Radiant Tcl Console

Radiant software 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 to the command line:

```
% <install_path>/bin/lin64/radiant
```

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

Running Commands Using CSH or BASH Interpreters

- You must run the following commands if you are using BASH:

```
% export bindir=<install_path>/bin/lin64
% source $bindir/radiant_env
```

- Next, you can run the executable files directly. For example, you can invoke the Radiant software GUI by using:

```
% pnmain &
```

- Or, you can run Power Calculator by running:

```
% pwcmain &
```

Chapter 5

IP (Intellectual Property) Licensing

Introduction to IP Cores

Lattice IP Cores are pre-tested, reusable functions that allow you to focus on their unique system architectures. These IP cores provide industry-standard functions such as PCI Express, DDR, Ethernet, CPRI, and embedded microprocessors. In addition, several independent IP providers have teamed with Lattice to offer additional high quality, reusable IP cores. For a complete listing of IP cores from Lattice and its 3rd party partners, please go to the Lattice IP page.

Please refer to the Product Selector Guide for the full IP Cores list and its device support.

Introduction to IP Licensing

Each Lattice IP core is a set of compiled code that implements a basic function, like a DDR2 memory controller, or a Tri-speed MAC, and is targeted/ optimized for a specific Lattice FPGA family. You can first use the IP tools in Diamond or Radiant to configure some parameters in the IP core (for example, with DDR2, you might configure the data word width to a particular length).

The IP tool generates a compiled **netlist**, which is sometimes called a **black box**, because while you can connect the inputs and outputs, you cannot see inside this compiled design. Finally, using Diamond or Radiant, you can integrate the IP with your custom RTL to create your final design, which can then be programmed into a Lattice FPGA. This custom code is sometimes called a **wrapper** as it wraps around the IP core to create the final design.

After you have completed your design, you can generate a bitstream file and program a Lattice FPGA.

If you have a copy of Diamond or Radiant, you already have access to all the IP core **code** via the IPexpress or IP Catalog tool. When you purchase an IP core, you now have a license to fully utilize this code - i.e. you have purchased a **key**, which comes in the form of a file called **license.dat**.

To get this file, you need to complete a request using the IP Subscription License Form. After completing the required fields in the form, we will email you a new license.dat file, which works with Diamond or Radiant, and unlocks the IP core.

Types of IP Licenses

There are 2 ways you can purchase a license to use Lattice IP cores. The type of IP license you purchase is reflected by the part number you order; so, there is only one way to license any specific IP core part number. These license types include:

- **Single Seat Annual License**: Use of the IP Core is limited to one (1) year from the date that Lattice issues an electronic license key to Licensee. If Licensee does not complete a Design within one (1) year from the date that Lattice issues an electronic license key to Licensee, such uncompleted Design may not be completed without the purchase of an additional license or extension for a renewal term. A node-locked Single Seat Annual License shall only be used on a unique machine with unique MAC address. A floating Single Seat Annual License shall only be used by one user at a time. Part numbers for a Single Seat Annual License will end in a suffix -US. These products are specific to a single type of IP, and a single target FPGA technology.
- **Single Seat Perpetual License**: The use of the IP Core is limited to the Licensee's Authorized Sites identified by Licensee in the IP Core Software Request Form on this website and approved by Lattice. The term of the Site Perpetual License is perpetual with respect the licensed IP Core and is a one-seat license. A node-locked Site Perpetual License shall only be used on a unique machine with unique MAC address. A floating Site Perpetual License shall only be used by one user at a time. Part numbers for a Multi-site Perpetual License will end in a suffix -UT. These products are specific to a single type of IP, and a single target FPGA technology.

For more information and support in IP licensing, please visit the Lattice IP Support page.

Free IP Licenses

Lattice Free IP (No License Required):

32-bit processor for Legacy Devices

- AHB-Lite Interconnect
- AHB-Lite to APB Bridge
- AHB-Lite to AXI4 Bridge
- APB Interconnect
- Avant MPPHY Module
- AXI Register Slice

- AXI4 Multi Port Bridge for Memory Controller
- AXI4 to AHB-Lite Bridge
- AXI4 to APB Bridge
- Flash Access
- HiGig Ethernet MAC
- iCE40 UltraPlus I2S IP
- Interleaver/De-Interleaver
- Lattice Mico8 Open, Free Soft Microcontroller
- LatticeMico32 Open, Free 32-Bit Soft Processor
- LPDDR3 Lite Memory Controller
- Octal SPI Controller
- PHY Interface for PCI Express - PIPE
- Platform Manager Utility Function Core IP
- Programmable Interrupt Controller (PIC)
- RISC-V I/O Physical Memory Protection (IOPMP)
- RISC-V MC CPU
- RISC-V Nano CPU
- RISC-V RX CPU
- RISC-V SM CPU
- Serial Rapid IO 2.1 Endpoint
- System Memory Module
- Tightly-Coupled Memory (TCM)
- Timer/Counter
- UART

Lattice Free IP (Requires License):

- 2D Edge Detector
- 64 Bit PCI Master/Target
- 64 Bit PCI Target
- 8-bit Correlator
- Automatic White Balance
- Cascaded Integrator-Comb (CIC) Filter
- DDR SDRAM
- Debayer
- Deinterlacer
- Digital Video Broadcasting - (DVB-ASI)
- Display Interface Multiplexer

- Distributed Arithmetic FIR Filter Generator
- Dynamic Block Reed Solomon Decoder
- Dynamic Block Reed Solomon Encoder
- eSPI Target
- GPIO
- I2C Controller
- I2C Target
- Internal Flash Controller
- Median Filter
- Numerically Controlled Oscillator
- QSPI Flash Controller
- SPI Controller
- SPI Flash Memory Controller
- SPI Target
- SPI4.2
- UART 16550
- Watchdog Timer

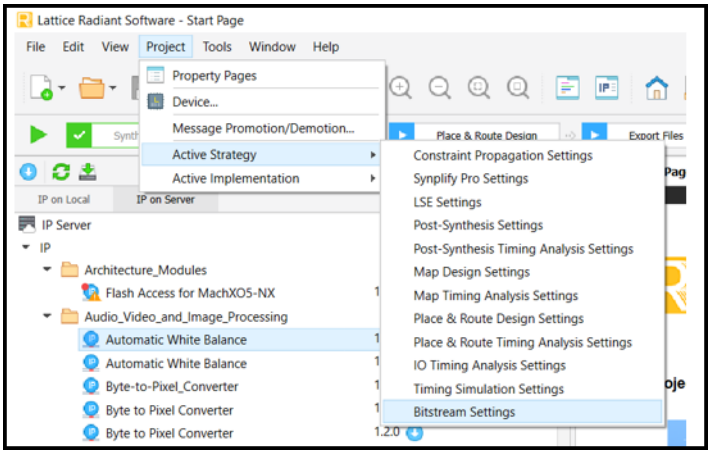
Evaluation Mode in IP

What are the limitations of using IP in Evaluation Mode?

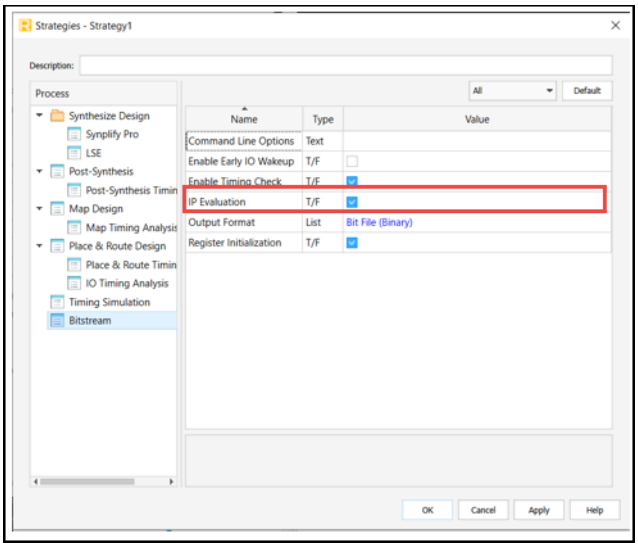
You can do nearly all your design and prototyping work without an IP license. If you do not have a license to use the IP core, the software will insert a **hardware timer** into the programming bitstream. This will cause the bitstream to **time-out** after a set period - usually from 30 minutes to about 4 hours. After the period expires, you can re-program the FPGA to reset the period. Also, without an IP license, full timing simulation is not available.

To turn on Evaluation Mode:

1. In the Project Tab, click **Active Strategy** > **Bitstream Settings**.



2. Check the **IP Evaluation** tick box.



3. Click **Apply** and **OK** to exit.

Chapter 6

Frequently Asked Questions

1. How do I manage my subscription licenses?

- Log in to our website and go to **Support** > **Licensing**.
- Under **Purchase/Renew Radiant License**, click **Subscription licensing**.
- Select **My Licenses** to view all licenses generated for your email address.

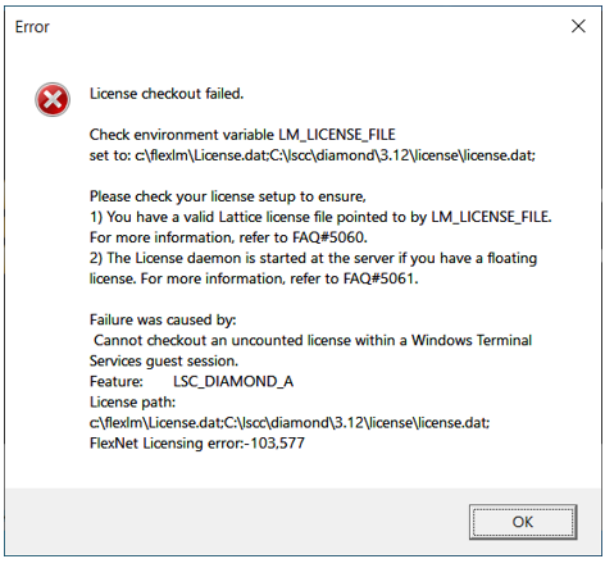
2. Why do I get the following warning: "WARNING - Device1 iM4A3-64/32 is a mature device, please contact Lattice for the license to enable this device" when loading a program for my CPLD?

Please keep in mind that when programming mature devices, you must use the Diamond Programmer stand-alone version. The Diamond Integrated Programmer (Programmer integrated into the Lattice Diamond software) lists the mature devices in the Device Selection and scans them, but it cannot program mature devices, even with the Mature Device license. Bypass is the only available operation.

- To program the mature device, visit our licensing page and request a Diamond-free license.

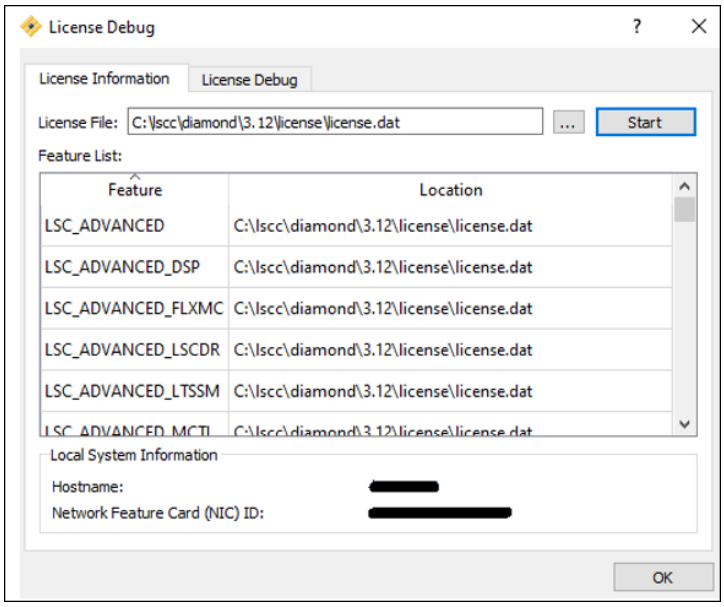
3. Why does my license fail when using a remote desktop?

The error shown below occurs when a Node-locked license is used for remote connections. The resolution to this is having TS_OK on the license file.

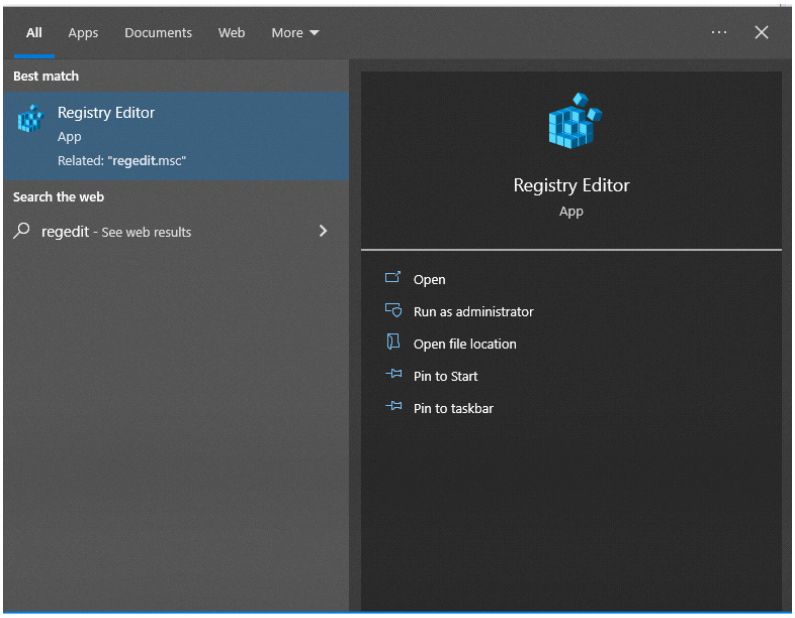


4. How to improve Diamond/Radiant/Propel software startup speed caused by invalid license paths?

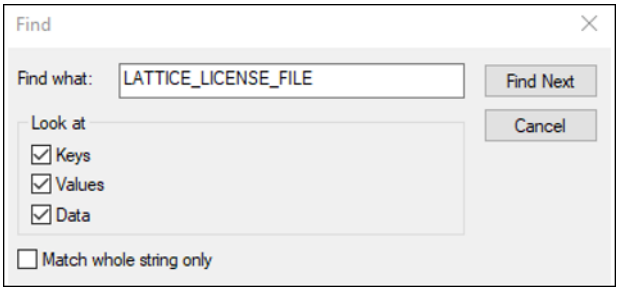
- In most cases, license paths can be edited using the LM_LICENSE_FILE in Windows Environment Variables (Windows Search Box > Edit Environment Variables).
- However, there are instances during software startup wherein the tool may search for previously used paths that no longer exist (for example, Network License Path). To verify this, go to Help > License Debug and press start. There should be no licensing errors as shown below.



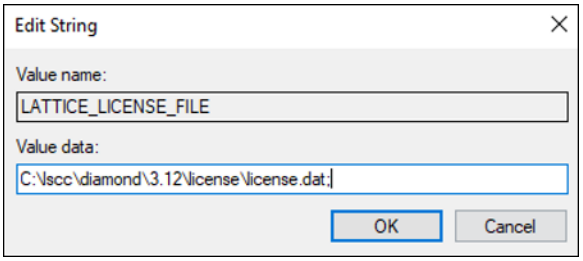
- If issues occur because of invalid paths not found in the LM_LICENSE_FILE environment variable, you can manually modify the registry item. You can exit Diamond or Radiant and type REGEDIT in the Windows Search Box.



- Open the Registry Editor and go to Edit > Find and search for LATTICE_LICENSE_FILE. This may take a few minutes.



- When the search results show the LATTICE_LICENSE_FILE registry entry, double-click it and delete any licensing locations that are no longer needed.



- To see if the program startup has improved, press OK and open Lattice Diamond or Lattice Radiant.

5. How to determine the MAC Address for Debian OS?

- You need to upgrade first to Debian testing for dependency on a newer library because Debian does not name the ethernet adaptor eth0.

  To fix this using systemd:

```
apt install net-tools (for ifconfig -a)
create /etc/systemd/network/80-eth0.link
[Match]

MACAddress=08:62:66:4a:22:e5 (your ethernet adaptor MAC
address)

[Link]

Name=eth0

then run update-initramfs -u
then reboot.
```

Note:

This workaround appears to have additional issues with script errors that may have dependencies on RHEL, as well as various requirements on 32-bit libraries before installing iCECube2.

6. How do I use the Serial Number I received from Lattice License Administrator to obtain my Software license?

- Log in to our website and navigate to the Licensing Support page or Support > Licensing. Click Diamond Subscription License. When you are in the License Generation page, here are the options you can do.
- Requesting a new license
  - Select New License or Request a New License.
  - Enter your Company Name and NIC (open an MS-DOS window and type "ipconfig /all" and press Enter. The MAC Address is a 12-digit hexadecimal value split into pairs with dashes, like this: 00-01-02-66-1D-E0. For Linux, type ifconfig -a).
  - Enter the Serial Number and click check SN. Save the file assuming no errors appear.
  - Your license should be delivered to your mailbox within a few minutes.

- Renewal of expired license
  - Go to My Licenses.
  - Choose the expired license record you want to renew with your new Serial Number and press E (for edit).
  - Select Request Renewal, then enter the Company Name, First Name, Last Name, Email, Serial Number and proceed click.
  - Select SN and save assuming no errors appear.
  - Your license should be delivered to your mailbox within a few minutes.
- License Extension
  - Go to My Licenses.
  - Choose the expired license record you want to renew with your new Serial Number and press E (for edit).
  - Scroll down to find the Extend 30 Days button and click Extend.
  - Your license should be delivered to your mailbox within a few minutes.

7. How can I switch or transfer my license to a different computer or PC?

To change or transfer a license to new computer or PC, submit a technical support case with the new computer's MAC address.

The license will be generated shortly after License Admin acknowledges the request.

Revision History

The following table gives the revision history for this document.

Date	Version	Description
10/10/2025	1.3	Updated for 2025.1.1 release.
12/20/2024	1.2	▶ Updated Chapter 4: Licensing Installation. ▶ Updated the IP license types.
06/28/2024	1.1	▶ Added Avant-G and Avant-X devices. ▶ Removed ispLEVER Classic Free License table.
11/22/2023	1.0	Initial release.