



Lattice Propel 2023.1

Release Notes

FPGA-AN-02065-1.0

June 2023

Disclaimers

Lattice makes no warranty, representation, or guarantee regarding the accuracy of information contained in this document or the suitability of its products for any particular purpose. All information herein is provided AS IS, with all faults and associated risk the responsibility entirely of the Buyer. Buyer shall not rely on any data and performance specifications or parameters provided herein. Products sold by Lattice have been subject to limited testing and it is the Buyer's responsibility to independently determine the suitability of any products and to test and verify the same. No Lattice products should be used in conjunction with mission- or safety-critical or any other application in which the failure of Lattice's product could create a situation where personal injury, death, severe property or environmental damage may occur. The information provided in this document is proprietary to Lattice Semiconductor, and Lattice reserves the right to make any changes to the information in this document or to any products at any time without notice.

Contents

About Lattice Propel™ 2023.1	4
What's New in Lattice Propel 2023.1	4
New Operating System (OS) Support	4
New Device Support	4
Tools and Enhancements.....	4
Key Features	4
Device Family Support	4
Processor Support	4
Operating System (OS) Support.....	4
Lattice Propel SDK.....	5
Lattice Propel Builder	5
IP Support	6
Template Design and System Simulation	6
Release Contents	7
Validation Platforms	7
System Requirements.....	7
Release Limitations.....	7
Known Issue.....	7
Technical Support	7

About Lattice Propel™ 2023.1

Welcome to the Lattice Propel 2023.1 design environment for Lattice FPGA system design. Lattice Propel is a complete set of graphical and command-line tools to create, analyze, compile, and debug both FPGA-based hardware and software processor systems.

What's New in Lattice Propel 2023.1

New Operating System (OS) Support

- Microsoft Windows 11 (64-bit)
- Red Hat Enterprise Linux 8.6 (64-bit)

New Device Support

- LFCPNX-50 (CertusPro™-NX)
- LFMXO5-55T (MachXO5™-NX)
- LFMXO5-100T (MachXO5™-NX)

Tools and Enhancements

- Supports soft JTAG (so far only applied on *Avant Hello World Project* and *Avant FreeRTOS Project*).
- Supports IP driver version tracking.
- Supports software data watchpoint.
- Supports input ports, output ports, and glue logic to be connected to inout ports.
- Supports using TCL command line to clear Tcl Console, create SoC, reconfigure glue logic, connect grouping signals.
- Supports Auto Connect grouping signals.
- Supports reference IP RTL from user-specified library in IP Packager.
- Supports generation and reconfiguration of an IP from a centralized IP repository.
- Supports subordinate sbx for design simplification and memory map display.
- Improves customized templates with constraint file included.
- Optimizes warnings and disables modifying Propel IPs in Lattice Radiant software.
- Added warning message for glue logic RTL that has been updated since it was originally added.
- Previous Propel software versions are available on Software Archive page on Company Public website:
<https://www.latticesemi.com/Support/SoftwareArchive>

Key Features

Device Family Support

- Lattice LAV-AT (Avant™)
- Lattice LFMXO5 (MachXO5™-NX)
- Lattice LIFCL (CrossLink™-NX)
- Lattice LFCPNX (CertusPro™-NX)
- Lattice LFMNX (Mach™-NX)
- Lattice LFD2NX (Certus™-NX)
- Lattice MachXO3D™
- Lattice MachXO2™
- Lattice MachXO3L™
- Lattice MachXO3LF™

Processor Support

- RISC-V Micro Controller (MC)
- RISC-V State Machine (SM)
- RISC-V RTOS (RX)
- Supports dual processors.

Operating System (OS) Support

- Microsoft Windows 11 (64-bit)
- Microsoft Windows 10 (64-bit)
- Red Hat Enterprise Linux 7.7 (64-bit)
- Red Hat Enterprise Linux 8.4 (64-bit)
- Red Hat Enterprise Linux 8.6 (64-bit)
- Ubuntu 20.04 LTS

Lattice Propel SDK

- Integrated picolibc as the default standard C library to support three levels of printf.
- Built-in industry standard components and tools for embedded software development and debugging.
- Optimized project management flow for Lattice FPGA platform.
- Supports creating both C and C++ software projects based on Lattice SoC platform.
- Supports Lattice Diamond[®], Lattice Radiant[™], and Propel Builder bridges.
- Integrated GNU Debugger (GDB) and Open On-Chip-Debugging (OCD) with chained JTAG.
- Supports peripherals view with register description during debug session.
- Supports syntax highlighting for various development languages.
- Supports printf through semihosting during On-Chip-Debugging.
- Supports multiple channels for On-Chip-Debugging.
- Supports soft JTAG.
- Supports IP driver version tracking.
- Supports software data watchpoint.

Lattice Propel Builder

- Supports adding some Lattice Radiant foundation IPs.
- Supports modifying a device.
- Supports displaying board information.
- Supports managing IPs.
- Supports schematic design.
- Supports creating SoC project and SoC verification in project wizard Graphic User Interface (GUI).
- Supports Lattice Diamond, Lattice Radiant, ModelSim/QuartaSim, and Propel SDK bridges.
- Supports generating simulation environment, testbench, and script.
- Integrated ModelSim Original Equipment Manufacturer (OEM).
- Supports glue logic.
- Supports IP Packager flow control.
- Supports hierarchical IP.
- Supports displaying the latest IP version in the Propel Builder catalog by default.
- Supports AXI4 and AXI4-Lite interface.
- Supports creating more flexible AXI-based SoC.
- Supports new GUI options, new interface, and VHDL.
- Supports input ports, output ports, and glue logic to be connected to inout ports.
- Supports using TCL command line to clear Tcl Console, create SoC, reconfigure glue logic, connect grouping signals.
- Supports Auto Connect grouping signals.
- Supports reference IP RTL from user-specified library in IP Packager.
- Supports generation and reconfiguration of an IP from a centralized IP repository.
- Supports subordinate sbx for design simplification and memory map display.
- Improves customized templates with constraint file included.
- Optimizes warnings and disables modifying Propel IPs in Radiant software.
- Added warning message for glue logic RTL that has been updated since it was originally added.

IP Support

For IP support, refer to related IP user guides.

Template Design and System Simulation

- Provides CertusPro-NX template design, the *Hello World Project*. Enhanced to support multiple clock domain.
- Provides CrossLink-NX template design, the *Hello World Project*.
- Provides MachXO2 template design, the *Hello World Project*.
- Provides MachXO3D template design, the *Hello World Project* and *Lattice Sentry RoT Project* (Windows OS only).
- Provides Mach-NX template design, the *Lattice Sentry RoT Project (484)* (Windows OS only) and *Lattice Sentry RoT Project (256)* (Windows OS only).
- Provides CertusPro-NX AXI based template design, the *RISC-V RX Demo Project* and *FreeRTOS Project*.
- Supports functional verification using system-level simulation environment for templates.
- Supports backward-compatible templates such as Sentry 1.0 and Sentry 2.1 projects.
- Provides LAV-AT-500E template design with *Hello World Project* and *FreeRTOS Project*.
- Provides CertusPro-NX template design, the *RISC-V MC Dual Processor Project*.

Release Contents

- Propel_2023.1.exe (Windows 10/11 64-bit Operating System)
- Propel_2023.1_lin.run (Red Hat Enterprise Linux 64-bit and Ubuntu LTS Operating System)

Validation Platforms

- Avant-E Evaluation Board (REV B LAV-500E-EVN)
- CertusPro-NX Evaluation Board (REV A P/N: LFCPNX-EVN)
- Certus-NX Versa Evaluation Board (REV B P/N: LFD2NX-VERSA-EVN)
- CrossLink-NX Evaluation Board (REV B P/N: LIFCL-40-EVN)
- MachXO2 Breakout Board (REV B P/N: LCMXO2-7000HE-B-EVN)
- MachXO3D Breakout Board (REV A P/N: LCMXO3D-9400HC-B-EVN)
- MachXO3D PFR Demo Board (REV A P/N: LCMXO3D-PFR-EVN)

System Requirements

Below are the basic system requirements for Propel 2023.1 on Microsoft Windows and Linux Operating System (OS):

- Intel Pentium or Pentium-compatible PC, or AMD Opteron system
- Windows 11 64-bit OS
- Windows 10 64-bit OS
- Red Hat Enterprise Linux 64-bit OS (RHEL7.7, 8.4, and 8.6)
- Ubuntu 20.04 LTS OS
- Free Disk Space: approximately 15 GB
- Network adapter and network connectivity for IP server access

Release Limitations

This release of Propel 2023.1 has the following limitations:

- No VHDL SoC simulation support in this release.
- Encrypted VHDL is only supported in Radiant flow, but not in Diamond flow.
- Diamond flow is not supported in Ubuntu 20.04 LTS and Win11.
- The MAX_PATH inside Windows file I/O API is restricted to 260 characters, but the usable path is even more constrained. The MAX_PATH must contain the drive letter and the NULL character to terminate the string correctly.
- Propel 2023.1 software does not support HW-USBN-2A cable.

Known Issue

The following is the known issue for the Propel 2023.1 release:

- Avant soft JTAG debugging is not available in Linux OS.

Technical Support

For assistance, submit a technical support case at www.latticesemi.com/techsupport.

For frequently asked questions, refer to the Lattice Answer Database at www.latticesemi.com/en/Support/AnswerDatabase.



www.latticesemi.com