Efinity® Software Installation User Guide

UG-EFN-INSTALL-v2.6
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www.efinixinc.com

Contents

Overview

The Efinity® software provides a complete tool flow for designing with Efinix® products. This document describes how to install the software.

Hardware and Software Requirements

- Computer with a 64 bit operating system, dual-core processor
- Machine memory requirements:
  - Trion T4, T8, T13, T20, T35—16 GB
  - Trion T55, T85, T120—32 GB
  - Titanium Ti35, Ti60—16 GB
  - Titanium Ti90, Ti120, Ti180—32 GB
- Linux environments:
  - Operating system:
    - Ubuntu v18.04 or later
    - Red Hat Enterprise x86-64 v7.4 or later
    - CentOS x86-64 v7.4 or later
  - Linux X11 windowing system (for Efinity® GUI)
  - Udev device manager for Efinix USB programming cable
    see Install the USB Driver (Linux) on page 4
- Windows environments:
  - Windows 8.1 or later, 64 bit operating system

    Note: This version has not been tested on Windows 11.

  - Microsoft Visual C++ 2015 x64 runtime library
    www.microsoft.com/en-us/download/details.aspx? id=52685

    Note: If you want to use the stand-alone Programmer, you also need to install the x86 and x64 libraries (64-bit systems) or x86 library (32-bit systems).

  - Zadig software to install USB drivers
    see Install the USB Driver (Windows) on page 5
  - Open-source Java 64-bit runtime environment; required for configuring the Sapphire RISC-V SoC and DMA Controller in the IP Manager; available from:
    - https://www.java.com/en/download/manual.jsp (Java 8)
    - https://developers.redhat.com/products/openjdk/download (OpenJDK 8 or 11)
    - http://jdk.java.net/16/ (OpenJDK 16)
- Your preferred text editor
- (Optional) free Icarus Verilog (iVerilog) simulator
  iverilog.icarus.com
- (Optional) GTKWave waveform viewer
  gtkwave.sourceforge.net

Third-Party Simulator Support

The Efinity tools do not include or explicitly integrate third-party simulators. However, Efinix has verified that the following simulators work with Efinity-generated Verilog HDL netlist files:

- Cadence Incisive Enterprise Simulator (ncsim)
- Mentor Graphics QuestaSim Simulator
- Free Icarus Verilog (iVerilog) simulator

To simulate an Efinity post-synthesis (or later compiler stage) Verilog HDL netlist, include the following library path as a resource in your third-party simulator:

```
<Efinity top-level path>/sim_models/verilog
```

Installing

Linux installation:

Unzip or untar the Efinity package into your user directory:

```
> tar -xjvf efinity-<version>.tar.bz2
```

Optional:

Run the following script to install a shortcut in your Desktop directory:

```
> <installation directory>/bin/install_desktop.sh
```

Windows installation:

Double-click the **efinity-<*version*>.msi** installer package and follow the on-screen instructions.

Install the USB Driver (Linux)

The following instructions explain how to install a USB driver for Linux operating systems.

1. Disconnect your board from your computer.
2. In a terminal, use these commands:

```
> sudo <installation directory>/bin/install_usb_driver.sh
> sudo udevadm control --reload-rules
```

Note: If your board was connected to your computer before you executed these commands, you need to disconnect and re-connect it.

Install the USB Driver (Windows)

On Windows, you use software from Zadig to install drivers (zadig.akeo.ie). In the Zadig software, the interface names end with *(Interface N)*, where *N* is the channel number.

Table 1: USB Driver Setup

Board	Connect to Computer with	Driver Setup
Trion T120 BGA576 development board Trion T120 BGA324 development board Trion T20 MIPI development board Trion T20 BGA256 development board Trion T8 BGA81 development board	USB cable	Composite device
Titanium development boards Xyloni Development Board	USB cable	Separate interfaces
Your own board	C232HM-DDHSL-0 cable FT2232H Mini Module FT4232H Mini Module	Composite device

Note: To use separate interfaces, you need the Efinity® software version 2020.1.140 with patch 2020.1.140.7.2 or later.

Driver Options

The Zadig software includes a variety of drivers. When programming Efinix FPGAs, use one of these drivers:

- **libusb-win32** (*version*)—This driver is more stable for unplug/plug events. This driver does not work when debugging with OpenOCD.
- **libusbK** (*version*)—Use this driver if you plan to use OpenOCD to debug any Efinix RISC-V SoC.

Warning: Do **not** choose the WinUSB driver.

Composite Device

Install a composite driver when you want all interfaces to appear as a composite device.

1. Connect the board to your computer with the appropriate cable and power it up.
2. Download the Zadig software from zadig.akeo.ie. (You do not need to install it; simply run the downloaded executable.)
3. Run the Zadig software.

   Note: To ensure that the USB driver is persistent across user sessions, run the Zadig software as administrator.

4. Choose **Options > List All Devices**.
5. Turn off **Options > Ignore Hubs or Composite Parents**.

6. Select the board, cable or module to target:
   - Select the Efinix development board; if there is more than one, choose the one shown as a composite.
   - If you are using the C232HM-DDHSL-0 cable or FTDI Chip Mini Modules, select **FTDIBUS (<*version*>)** and USB ID:
     - **0403 6014** for C232HM-DDHSL-0 cable
     - **0403 0610** for FT2232H
     - **0403 0611** for FT4232H
7. Select **libusb-win32** or **libusbK** in the **Driver** drop-down list. (Do **not** choose WinUSB.)
8. Click **Replace Driver**.
9. Repeat steps 4 - 8 for each unique JTAG device you want to target. For example, if you want to use both the T8 and T20 development boards, you must install 2 USB drivers, one for each board.
10. Close the Zadig software.

When you open the Device Manager in the Windows Control Panel, it displays the new USB device driver.

Separate Interfaces

You install drivers for separate interfaces when you want to use each interface independently.

Important: For some Efinix development boards, Windows automatically installs drivers for some interfaces when you connect the board to your computer. You do not need to install another driver for these interfaces. Refer to the user guide for your development board for specific driver installation requirements.

1. Connect the board to your computer with the appropriate cable and power it up.
2. Download the Zadig software from zadig.akeo.ie. (You do not need to install it; simply run the downloaded executable.)
3. Run the Zadig software.

Note: To ensure that the USB driver is persistent across user sessions, run the Zadig software as administrator.

4. Choose **Options > List All Devices**.
5. Repeat the following steps for each interface. The interface names end with *(Interface N)*, where *N* is the channel number.
   - Select **libusb-win32** or **libusbK** in the **Driver** drop-down list. (Do **not** choose WinUSB.)
   - Click **Replace Driver**.
6. Close the Zadig software.

Installing Patches

You download Efinity® patches separately from the software and then install them into your existing Efinity® installation directory.

Linux

1. Download the patch from the Efinity® page in the Support Center.
2. Open a terminal window.
3. Unzip the patch into any temporary directory:

```
> unzip efinity-<version>-patch.zip
```

4. Setup the environment variables:

```
> source /path/to/efinity/<version>/bin/setup.sh
```

5. Run the patch installer:

```
> cd efinity-<version>-patch
> ./run.sh
```

Windows

1. Download the patch from the Efinity® page in the Support Center.
2. Unzip the patch into any temporary directory:
   Double-click the patch filename in the Windows Explorer and choose **Extract all**.
   Alternatively, type the following command at a command prompt:

```
> unzip efinity-<version>-patch.zip
```

3. Setup the environment variables by typing these commands at a command prompt:

```
> \path\to\efinity\<version>\bin\setup.bat
```

4. Run the patch installer by typing these commands at a command prompt:

```
> cd efinity-<version>-patch
> run.bat
```

Efinity Quick Start

To launch the Efinity graphical user interface (GUI), double-click the Efinity desktop icon. To launch and use the Efinity tool from the command line, refer to the following sections.

Linux

Set up your environment and PATH:

```
> source bin/setup.sh
```

Launch the Efinity GUI from the command line:

```
> efinity
```

Run Efinity from the command line:

```
> cd $EFINITY_HOME/project/<project name>  // Change to project directory
> efx_run.py <project name>.xml            // Run Efinity
```

For command-line help:

```
> efx_run.py --help
```

Windows

Set up your environment and PATH:

```
> bin\setup.bat
```

Launch the Efinity GUI from the command line:

```
> bin\setup.bat --run
```

Run Efinity from the command line:

```
> cd %EFINITY_HOME%\project\<project name>  // Change to project directory
> efx_run.bat <project name>.xml            // Run Efinity
```

For command-line help:

```
> efx_run.bat --help
```

Where to Learn More

The Efinity® software includes documentation as PDF user guides and on-line HTML help. This documentation is provided with the software. You can also access the latest versions of PDF documentation in the Support Center:

- Efinity Software User Guide
- Efinity Synthesis User Guide
- Efinity Timing Closure User Guide
- Efinity Software Installation User Guide
- Efinity Trion Tutorial
- Titanium Interfaces User Guide
- Trion Interfaces User Guide
- Efinity Interface Designer Python API
- Quantum Trion Primitives User Guide
- Quantum Titanium Primitives User Guide

In addition to documentation, Efinix field application engineers have created a series of videos to help you learn about aspects of the software. You can view these videos in the Support Center.

Revision History

Table 2: Document Revision History

Date	Version	Description
December 2021	2.6	Updated machine memory requirements (RAM).
October 2021	2.5	When using the stand-alone Programmer on 64-bit Windows, install both the x86 and x64 libraries. (DOC-576)
September 2021	2.4	JRE required for running the DMA Controller in the IP Manager. (DOC-549)
June 2021	2.3	Supported Ubuntu version is v18.04 or higher. v16.04 is end of life. (DOC-433) Added the Java runtime environment as a software requirement for configuring the Sapphire SoC in the IP Manager. Updated the Windows USB driver installation topic.
December 2020	2.2	Added the requirement to install the Microsoft Visual C++ 2015 x64 and x86 runtime libraries for the standalone Programmer.
November 2020	2.1	Updated instructions on installing USB drivers for Windows.
June 2020	2.0	Added instructions on how to install software patches. Windows 7, Red Hat v6, and CentOS v6 no longer supported. Provided new driver when installing USB drivers on Windows with Zadig software. Added FTDI Dual RS232 HS mini module in steps to install the USB driver.
December 2019	1.7	Updated Zadig USB driver information for Windows.
August 2019	1.6	Updated Quick Start command-line instructions.
January 2019	1.5	Added instructions on installing the USB driver for Windows.

Date	Version	Description
October 2018	1.4	Added Python 3 to the software requirements list. For Windows, if you do not have a full version of Python, the .py extension may not be correctly associated with Python.
June 2018	1.3	Removed Python requirement; as of this release, Python is included with the software. Added the requirement that Windows users install the Microsoft Visual C++ 2015 x64 runtime library.
April 2018	1.2	No changes.
November 2017	1.1	Removed references to OPM family. Removed instructions for setting external code editor (this version embeds a Code Editor).
May 2017	1.0	Initial release.