



# Dolby Encoding Engine HEVC Encoder

## Installation Guide

2.3  
4 February 2019

## 1 Dolby Encoding Engine HEVC Encoder Installation Guide

The Dolby Encoding Engine is a standalone, file based software encoder, that supports encoding of Dolby Vision, Dolby Digital Plus with Dolby Atmos content and Dolby Digital Plus formats and provides MP4/TS muxing functionality.

This guide covers the installation and license activation of Dolby Encoding Engine as well as the procedures required to install the x265 HEVC encoder.

## 2 Contacting Dolby

Support services are available to address any questions about this product.

For any questions regarding the described technology, contact [dee-support@dolby.com](mailto:dee-support@dolby.com).

If you have comments or feedback about this information set, send us an email at [documentation@dolby.com](mailto:documentation@dolby.com).

## 3 Dolby Encoding Engine installation

Install the Dolby Encoding Engine using the provided installer package and the license file.

- [Installing Dolby Encoding Engine on Linux](#)
- [Installing Dolby Encoding Engine on Windows](#)
- [Adding product license](#)

### 3.1 Installing Dolby Encoding Engine on Linux

Unpack the Dolby Encoding Engine and launch the installer from the CLI with the specified installation parameters.

#### Procedure

1. Optional: If you are upgrading to a newer version of the Dolby Encoding Engine, uninstall and remove all components of the previous version (including the plug-ins and other libraries).
2. Unpack the .zip file.
3. Add the permission to execute the file.
4. Optional: To display the available installer options, enter: `dolby_encoding_engine_install.bin -h`
5. To launch the installer, enter: `dolby_encoding_engine_install.bin -d <folder_path>`  
In this entry:  
`<folder_path>` is the installation folder.
6. Follow the instructions on the screen.

#### Results

The Dolby Encoding Engine installs on your computer.

### 3.2 Installing Dolby Encoding Engine on Windows

Unpack the Dolby Encoding Engine, and launch the installer file.

#### Procedure

1. Optional: If you are upgrading to a newer version of the Dolby Encoding Engine, uninstall and remove all components of the previous version (including the plug-ins and other libraries).
2. Unpack the .zip file.
3. Launch the `dolby_encoding_engine_install.exe` file.
4. Follow the instructions on the screen.

#### Results

The Dolby Encoding Engine installs on your computer.

### 3.3 Adding product license

To use the Dolby Encoding Engine, add your product license to the folder specified in this procedure.

#### About this task

We recommend placing the Dolby Encoding Engine product license in the application folder or the plug-ins folder (specified by the `DEE_PLUGIN_PATH` environment variable).


Placing the license file in a different location requires you to specify the license file path in the for each operation, using the `--license-file` option.

## Procedure

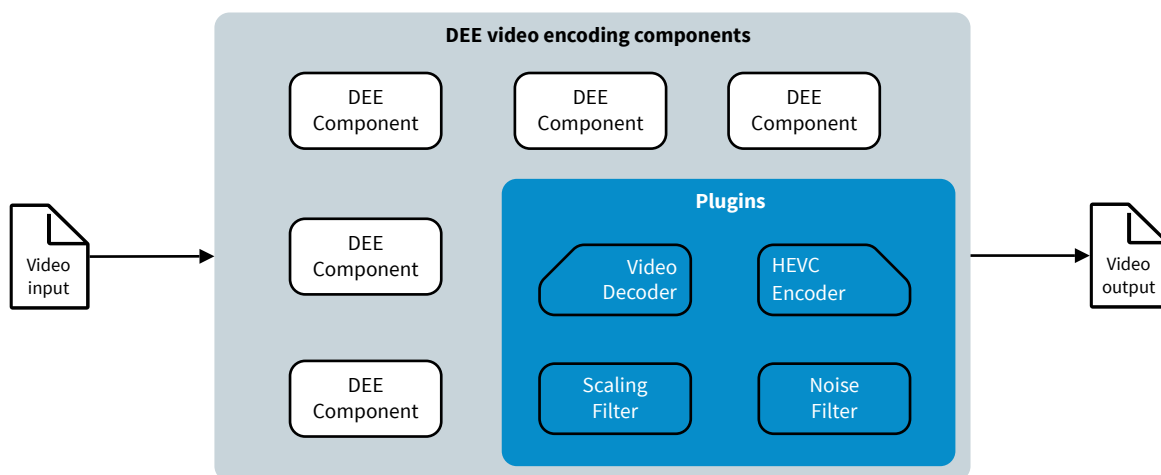
Place the `license.lic` file in the application folder or the plug-ins folder.

## 4 Plugins

A standard installation of Dolby Encoding Engine includes default plugin implementations for J2K decoding, scaling, and noise reduction. The Dolby Encoding Engine allows you to replace these components with others that perform the same processing functions.

 **Note:** Dolby Encoding Engine does not include an HEVC encoder but requires such an encoder to be installed.

*Figure 1: Dolby Encoding Engine plugins*



For all the current information about Dolby Vision plugins, refer to <https://github.com/DolbyLaboratories/dolby-encoding-engine>. The repository contains example plugins as well as information on how to build new plugins. You must place the plugin in the Dolby Encoding Engine structure. The location for the plugins is the Dolby Encoding Engine folder or another location defined by the `DEE_PLUGIN_PATH` environment variable.

For the particular example of the x265 HEVC encoder plugin, follow the instructions in this document.

## 5 x265 plugin installation on Linux

To install the x265 HEVC encoder plugin on Linux, follow these instructions in the following order.

- [Installing NASM on Linux](#)
- [Downloading resources](#)
- [Setting up folders on Linux](#)
- [Building the x265 library on Linux](#)
- [Building the x265 plugin on Linux](#)

### Pre-requisites:

- GCC 4.8.5
- CMake (v3 or higher) - see <https://cmake.org/install/>

## 5.1 Installing NASM on Linux

Install NASM (Netwide Assembler, verified with 2.13.03) to compile the best performance version of the x265 library.

### Procedure

1. To download the file, in the CLI enter  
`wget www.nasm.us/pub/nasm/releasebuilds/2.13.03/nasm-2.13.03.tar.xz`
2. To extract the file, enter  
`tar -xvf nasm-2.13.03.tar.xz`
3. Go to the extracted directory and, to build and install NASM, enter:

```
./configure
make
sudo make install
```

## 5.2 Downloading resources

Before creating plugins, you need to download the Dolby Encoding Engine plugins repository and the x265 (v2.8) HEVC encoder.

### Procedure

1. To download the Dolby Encoding Engine plugins repository, go to <https://github.com/DolbyLaboratories/dolby-encoding-engine> and click on **Clone or download** > **Download ZIP**
2. Extract the zip file to a separate folder.
3. To download the source code for the x265 HEVC encoder library, go to <https://bitbucket.org/multicoreware/x265/downloads/>  
The currently supported version is x265\_2.8
4. Extract the .gz file to a separate folder.

## 5.3 Setting up folders on Linux

To compile the x265 HEVC plugin, you need a specific folder structure and a system variable.

### Procedure

1. Create the following folders:
  - a) X265/include
  - b) X265/lib/linux64
2. Set the X265 folder as a system variable: navigate to the folder and in the CLI enter  
`export X265ROOT=$PWD`
3. Optional: You can check if you set up the folder as a system variable correctly. Enter  
`echo $X265ROOT`

The X265 folder path appears.

## 5.4 Building the x265 library on Linux

Build the x265 library with an at-least 10 bit API. The multilib build script allows you to build a library containing an 8/10/12-bit API.

### Procedure

1. Navigate to the folder where you downloaded the x265 HEVC encoder library.
2. In that folder, go to `x265_2.8/build/linux`
3. In the CLI, enter `./multilib.sh`  
The library is compiled.
4. From the `x265_2.8/build/linux/8bit` folder, copy the `libx265.so` and `libx265.so.160` files to the `X265/lib/linux64` folder.
5. Copy the `x265_config.h` file to the `X265/include` folder.
6. From the `x265_v2.8/source` folder, copy the `x265.h` file to the `X265/include` folder.

## 5.5 Building the x265 plugin on Linux

With the compiled x265 library, you can proceed to building and installing the plugin in Dolby Encoding Engine.

### Procedure

1. In the Dolby Encoding Engine plugins repository downloaded from Github, go to `dolby-encoding-engine-master/plugins/code/hevc_enc/x265/make/hevc_enc_x265/linux_amd64_gnu`
2. To build the plugin, in the CLI enter: `make`  
The script creates the `hevc_enc_x265_release.so` file.
3. Copy the `hevc_enc_x265_release.so` file to the Dolby Encoding Engine installation folder.
4. From the `X265/lib/linux64` folder, copy the `libx265.so.160` file to the Dolby Encoding Engine installation folder.

### Results

You have installed the x265 HEVC encoder plugin in the Dolby Encoding Engine.

# 6 x265 plugin installation on Windows

To install the x265 HEVC encoder plugin on Windows, follow these instructions in the following order.

- [Installing NASM on Windows](#)
- [Downloading resources](#)
- [Setting up folders on Windows](#)
- [Building the x265 library on Windows](#)
- [Building the x265 plugin on Windows](#)

### Pre-requisites:

- Visual Studio 2013

- CMake (v3 or higher) – see <https://cmake.org/install/>

## 6.1 Installing NASM on Windows

Install NASM (Netwide Assembler, verified with 2.13.03) to compile the best performance version of the x265 library.

### Procedure

1. Download the installer file: <https://www.nasm.us/pub/nasm/releasebuilds/2.13.03/win64/nasm-2.13.03-installer-x64.exe>
2. To install NASM, execute the installer and follow the instructions.
3. Add the NASM installation directory to PATH.

## 6.2 Downloading resources

Before creating plugins, you need to download the Dolby Encoding Engine plugins repository and the x265 (v2.8) HEVC encoder.

### Procedure

1. To download the Dolby Encoding Engine plugins repository, go to <https://github.com/DolbyLaboratories/dolby-encoding-engine> and click on **Clone or download** > **Download ZIP**
2. Extract the zip file to a separate folder.
3. To download the source code for the x265 HEVC encoder library, go to <https://bitbucket.org/multicoreware/x265/downloads/>  
The currently supported version is x265\_2.8
4. Extract the .gz file to a separate folder.

## 6.3 Setting up folders on Windows

To compile the x265 HEVC plugin, you need a specific folder structure and a system variable.

### Procedure

1. Create the following folders:
  - a) X265\include

b) X265\lib\windows64

2. Set the X265 folder as a system variable.
3. Optional: Check if you set up the folder as a system variable correctly.

## 6.4 Building the x265 library on Windows

Build the x265 library with an at-least 10 bit API. The multilib build script allows you to build a library containing an 8/10/12-bit API.

### Procedure

1. Navigate to the folder where you downloaded the x265 HEVC encoder library.
2. In that folder, go to x265\_2.8\build\vc12-x86\_64
3. In the CLI, enter `.\multilib.bat`  
A message displays: Found nasm: C:\...\NASM\nasm.exe (found version "2.13.03") Found Nasm 2.13.03 to build assembly primitives x265 version 2.8
4. From the x265\_2.8\build\windows\8bit folder, copy the libx265.lib and libx265.dll files to the X265\lib\windows64 folder.
5. Copy the x265\_config.h file to the X265\include folder.
6. From the x265\_v2.8\source folder, copy the x265.h file to the X265\include folder.

## 6.5 Building the x265 plugin on Windows

With the compiled x265 library, you can proceed to building and installing the plugin in Dolby Encoding Engine.

### Procedure

1. In the Dolby Encoding Engine plugins repository downloaded from Github, go to `dolby-encoding-engine-master\plugins\code\hevc_enc\x265\make\hevc_enc_x265\windows_amd64_msvs`
2. Build the plugin using the `hevc_enc_x265_2013.sln` file.
3. Copy the .dll library to the Dolby Encoding Engine installation folder.
4. From the X265\lib\windows64 folder, copy the libx265.dll file to the Dolby Encoding Engine installation folder.

### Results

You have installed the x265 HEVC encoder plugin in the Dolby Encoding Engine.