

# Media Samples Guide

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## Overview

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Samples work with **Intel® Media SDK 2016** and **Intel® Media Server Studio 2017 for Windows\* Server**.

They demonstrate how to incorporate the **Intel® Media SDK 2016 for Windows** and **Intel® Media Server Studio – SDK** (hereinafter referred to as "**SDK**") API into various applications.

Some samples can work with **Intel® Media Server Studio – HEVC Decoder & Encoder** (hereinafter referred to as "**HEVC Encoder**", "**HEVC Decoder**", "**HEVC**").

Not all of the samples listed below might be applicable and supported for a particular product. Make sure to check the respective release notes document for potential limitations.

## What's New

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- Transcoding sample (sample\_multi\_transcode) is extended with new options:
  - QSV-FF mode
  - New deinterlace mode (ADI\_SCD and BOB)
- Sample VPP is extended with new options: rotation, color saturation, auto contrast enhancements (see full list in readme-vpp).
- Sample decode now writes data to the file using the color format received from decoder. Previously I420 format was used by default, now you have to specify it explicitly if you want to use it (-i420 option).
- New options are added to sample\_encode:
  - YUY2 input format
  - QSV-FF mode
  - GOP size, IDR Interval
  - I to P frames distance
  - Number of reference frames
  - B pyramid reference option
- sample\_h265\_gaa is not supported any more.
- Most recent version of OpenCL™ Code Builder included into Intel® Media Server Studio 2017 for Windows has changes in header files structure - now we should use "cl\_dx9\_media\_sharing.h" instead of "cl\_d3d9.h" - so code of sample\_plugin\_opengl is modified to reflect this.

## Package contents

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**Full list of available samples:**

- **Video Decoding Sample**

Console application which performs decoding of elementary compressed video stream to raw frames. Includes the following features:

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- stereoscopic 3D (S3D) rendering of elementary MVC (Multi-View Video Coding) streams
- decoding of HEVC (High Efficiency Video Coding) video via **HEVC Decoder**
- decoding with video post processing (color conversion) of raw video sequences
- screen capturing via screen capture plugin

- **Video Encoding Sample**

Console application which performs encoding of raw video frames into elementary compressed stream. Includes the following features:

- video resizing
- video rotation via User Plug-in Sample
- video rotation via User Plug-in Sample using OpenCL™
- encoding HEVC video via **HEVC Encoder**

- **Video Processing Sample**

Console application which performs various video processing algorithms on raw frames.

- **Video Transcoding Sample**

Console application which performs transcoding of elementary video stream from one compressed format to another. Includes the following features:

- multiple video streams transcoding
- video resizing, de-interlacing
- video rotation via User Plug-in Sample
- video rotation via User Plug-in Sample using OpenCL
- video processing using VPP algorithms

- **OpenCL Video Motion Estimation Sample**

Console application which provides step-by-step guidelines on the using Intel's motion estimation extension for OpenCL standard. The motion estimation extension includes a set of host-callable functions for frame-based Video Motion Estimation.

- **OpenCL Interoperability Sample**

GUI application which demonstrates how to use **SDK** and Intel® OpenCL SDK together for efficient video decoding and fast post-processing.

- **Intel® Media SDK RAW Media Accelerator Sample (Camera Sample)**

Console application that demonstrates how to use **SDK** and Intel® Media SDK RAW Media Accelerator together for efficient RAW camera data capturing and processing.

Each sample includes:

- a readme file for each sub-sample
- source and header files for each sub-sample

**Samples** package has one installer for all sub-samples.

## Software & Hardware Requirements

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### Hardware:

- Hardware requirements are the same as described in Intel® Media Server Studio Release Notes or Intel® Media Software Development Kit Release Notes (whichever samples are used with)
- (Optional) HDMI\* 1.4, eDP\* 1.1 or similar based monitor/TV as primary display
- (Optional) Active shutter glasses

### Software:

- Microsoft Windows\* 7, Microsoft Windows\* 8, Microsoft Windows\* 8.1 or Microsoft Windows\* 10

- For Microsoft DirectX\* 11 functionality - Microsoft Windows 8 or Microsoft Windows 8.1.
- Microsoft Visual C++\* 2010 or later version of Microsoft Visual C++ (if exact version is not specified in particular sample readme).
- For samples - Microsoft Windows SDK for Windows 7 or Microsoft Windows SDK for Windows 8.
- For Microsoft DirectX 11 enabled samples - Microsoft Windows SDK for Windows 8.
- Intel® Media SDK 2016 or Intel® Media Server Studio 2016
- For **OpenCL User Plug-in, OpenCL Video Motion Estimation Sample and OpenCL Interoperability Sample - CodeBuilder** (part of **Intel® Media SDK 2016 or Intel® Media Server Studio 2016**) for compilation, OpenCL driver – to run the samples.
- For PTIR feature in **Video Processing Sample - Intel® Media Server Studio 2016 Professional** edition is needed.

## Installation

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Run the `IntelMediaSamples.msi` installer from the package to install all the samples.

## Build Instructions

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1. `INTELMEDIASDK_WINSDK_PATH` environmental variable:
  - **Samples** depend on Microsoft\* Windows\* SDK include and library files.
  - **Samples** installer will try to set `INTELMEDIASDK_WINSDK_PATH` environment variable used in sample project files to locate those include and library files.
  - You may want to set (possibly to “”) `INTELMEDIASDK_WINSDK_PATH` variable manually (possibly with the help of `<install-folder>\samples\set_INTELMEDIASDK_WINSDK_PATH.bat`) in the following cases:
    - The variable was not set during installation due to no Microsoft Windows SDK installed or installed to a non-default location.
    - Your Microsoft Visual Studio\* environment is already set up with Microsoft Windows SDK include and library directories (e.g. via registration script for Microsoft Visual C++\* 2005). Set the variable to “” or delete it in this case.
    - You wish to use a different Microsoft Windows SDK version than was auto-detected and set at installation.
2. `INTELMEDIASDKROOT` environmental variable:
  - Samples depend on **SDK** external headers and **SDK** dispatcher library which are searched in folders `INTELMEDIASDKROOT\include` and `INTELMEDIASDKROOT \lib\<arch>` respectively.
  - `INTELMEDIASDKROOT` is set by **SDK** installer and points to the **SDK** installation folder.
3. OpenCL headers and libraries for **OpenCL User Plug-in, OpenCL Video Motion Estimation Sample and OpenCL Interoperability Sample**:
  - These samples require OpenCL headers and libraries to be available. All needed files are located in **Code Builder** (part of **Intel® Media SDK 2016 or Intel® Media Server Studio 2017**). Please install Code Builder from the package and set up `INTELOCLSDKROOT` environment variable to `<code-builder-install-folder>\include\cl\` folder.
4. Building with Microsoft Visual C++\*:
  - Use provided with each sample solution file `.sln` with Microsoft Visual C++ version 2005 or later to build the respective sample. Locate the resulting executable file in the folder `<install-folder>\_build \<PlatformName>\<ConfigurationName>`.
5. Choosing Microsoft DirectX\* version to build with:
  - If version of the installed Microsoft Windows\* SDK is 8.0 or above, then Microsoft DirectX\* 11.1 surfaces support will be enabled in sample by default. You can enable or disable it manually using `MF_X_D3D11_SUPPORT` macros defined in `<install-folder>\sample_common\sample_defs.h`

## 6. Building using Debug configuration.

- Debug\_WithDebugAPI configurations of samples are dependent on debug versions of dispatcher library (libmfx\_d.lib). This library is an open source project, so you may build it from source code. Note, that libmfx\_d.lib is not provided in binary form, so it has to be built manually. Source code of dispatcher library is available at **Intel® Media SDK 2016** and **Intel® Media Server Studio 2017 for Windows Server**

## Running the Software

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Running **Samples** with Intel® OpenCL dependency:

- Make sure proper OpenCL driver is installed on the machine. Please refer to <https://software.intel.com/en-us/articles/opencl-drivers> for details.
- Add a path to opencl.dll from the driver installation above to PATH variable

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