

User Manual

# DSPC-8601-USBE

**ADVANTECH**

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# Chapter 1

Overview

## 1.1 Introduction

DSPC-8601-USBE is an USB 2.0 high-speed video capture module with 1 analog video input and 1 stereo audio input. DSPC-8601-USBE supports H.264 compression formats up to full D1 resolution at real-time frame rate (30/25fps). With an easy-to-use software development kit (SDK), DSPC-8601-USBE is an ideal solution for system integrators to implement versatile video capturing and encoding applications.

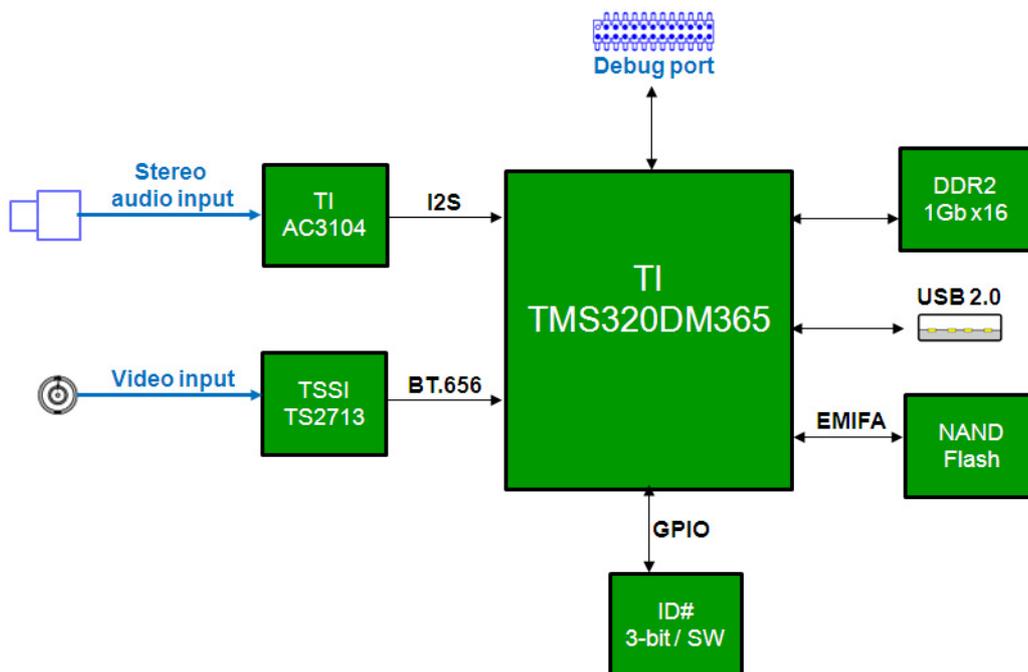
## 1.2 Features

- Supports on-board hardware-based H.264 compression
- Supports on-board PCM / G.711 hardware-based audio compression
- 30/25 fps (NTSC/PAL) at up to full D1 (720 x576) recording
- USB bus power
- Supports up to 8 devices with one PC (by setting device ID)
- SDK with VC++ sample codes

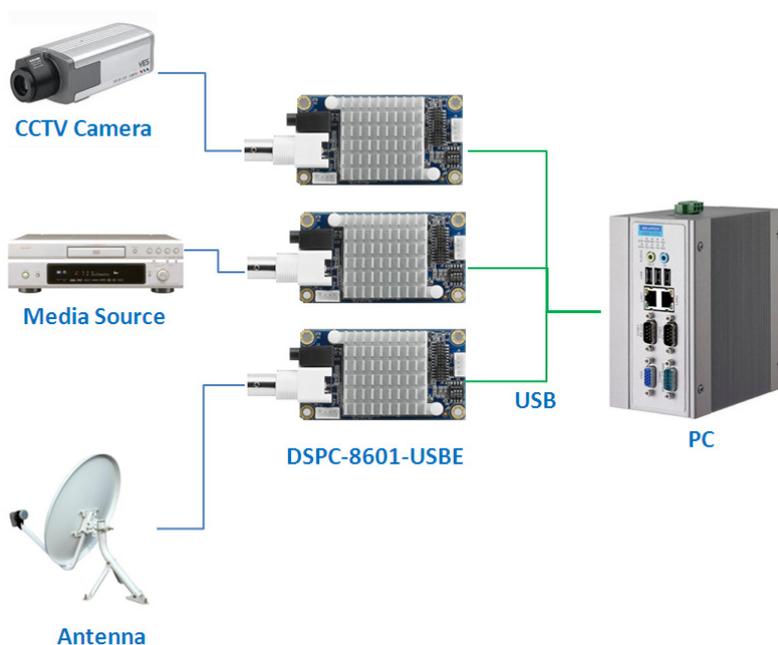
## 1.3 Specifications

<b>Video Input</b>	
Channels	1
Video inputs	Composite for NTSC/PAL
Compression	H.264 / RAW
Dual Streams	Yes
Frame Rate	Up to 30 fps @NTSC / 25 fps @ PAL (adjustable)
Bit Rate Control	Supports constant bit rate (CBR) & variable bit rate (VBR)
OSD	Text OSD
Connector	BNC, male / 1.0 Vp-p, 75 ohms
<b>Audio Input</b>	
Channels	1 x stereo line-in
Sampling Rates	Up to 16 bit, 48 KHz, stereo
Compression	PCM / G.711
Connector	Phone jack, female
<b>Physical Characteristics</b>	
Host Interface	USB 2.0 High Speed
Power input	USB bus power
Operating Temperature	0 ~ 70° C (32 ~ 158° F) (needs air flow when operating temperature over 60° C/140° F)
Board Dimensions	70 x 38 mm (2.75" x 1.49")
Safety	CE / FCC
<b>Software Development Kit</b>	
Operating System Supported	Windows XP / XPe / Vista / 7
Direct X Required	Version 9 or above

## 1.4 Block Diagram



## 1.5 Typical Application



## 1.6 HW Introduction

### 1.6.1 Dimension

Below is the HW dimension.

Unit: mm.

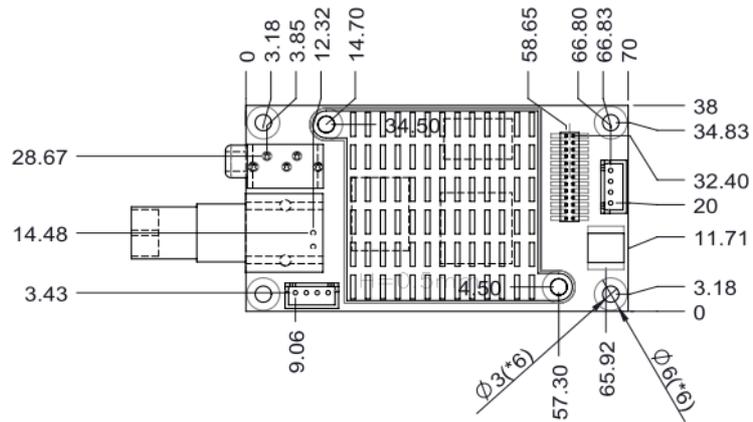


Figure 1.1 Top View of DSPC-8601-USBE

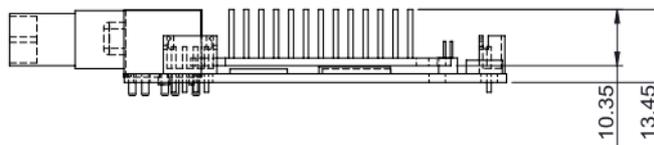


Figure 1.2 Side View of DSPC-8601-USBE

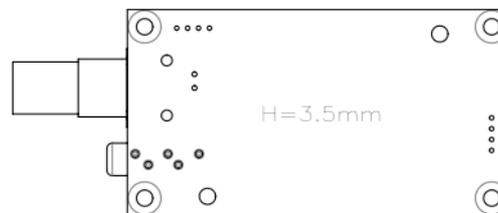


Figure 1.3 Bottom View of DSPC-8601-USBE

## 1.6.2 Connectors

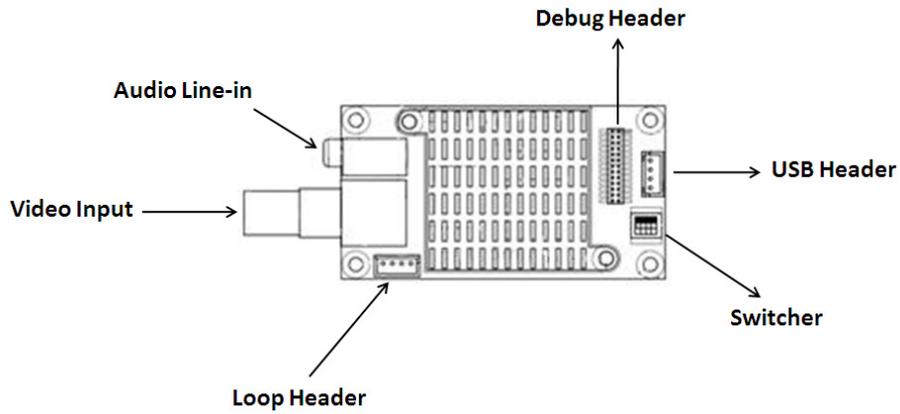
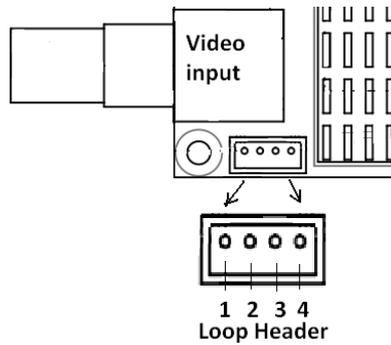


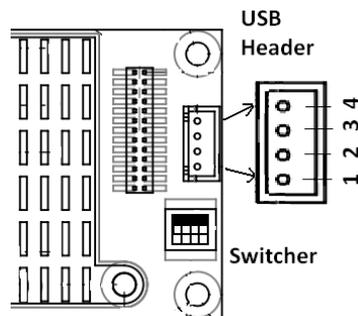
Figure 1.4 Connector of DSPC-8601-USBE

### Loop header



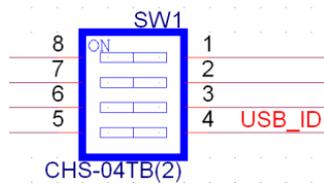
Pin	Signal
1	CVBS
2	AUDIO_L
3	AUDIO_R
4	GND

### USB header



Pin	Signal
1	USB0_VBUS_CONN
2	USB0_DN
3	USB0_DP
4	GND

### Switch setting



SW1	TARGET
Default	OFF (1) ON (0)
DEVICE ID	000 011 110
8-1 7-2 6-3	001 100 111
	010 101
USB ID 5-4	Device Mode Host Mode

# Chapter 2

Installation

## 2.1 Min. System Requirements

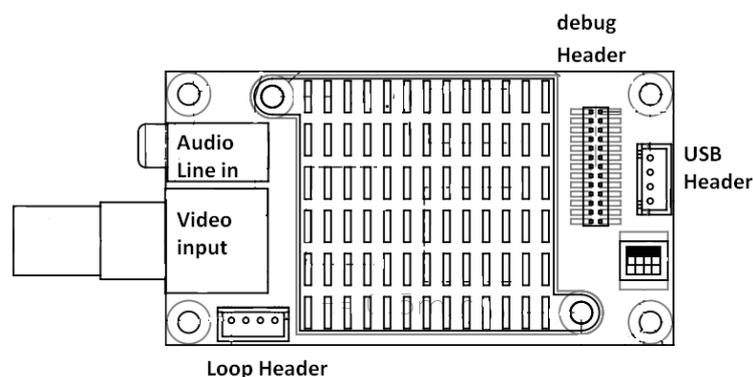
One X86 personal computer with:

- Intel Pentium 4 CPU
- 512 MB RAM
- 500MB HDD
- One USB 2.0 port.
- Operating Systems - Windows XP or above

## 2.2 Hardware Installation

### 2.2.1 System Setup

Users can set up one video capturing system by connecting DSPC-8601-USBE with video source devices and a PC according to the connector function definitions as below.



**Figure 2.1 All connectors of DSPC-8601-USBE**

#### **Connection with audio inputs**

Connect the audio device with phone jack connector to the Audio Line-In port.

#### **Connection with video inputs**

Connect the video source (NTSC or PAL) with BNC male connector to the Video Input port.

#### **Connection with USB port**

Connect the USB cable to the USB Header.

#### **Connection with Loop Header**

Connect the video and audio output device to the Loop Header (one special-made cable is needed).

# Chapter 3

## Software Installation

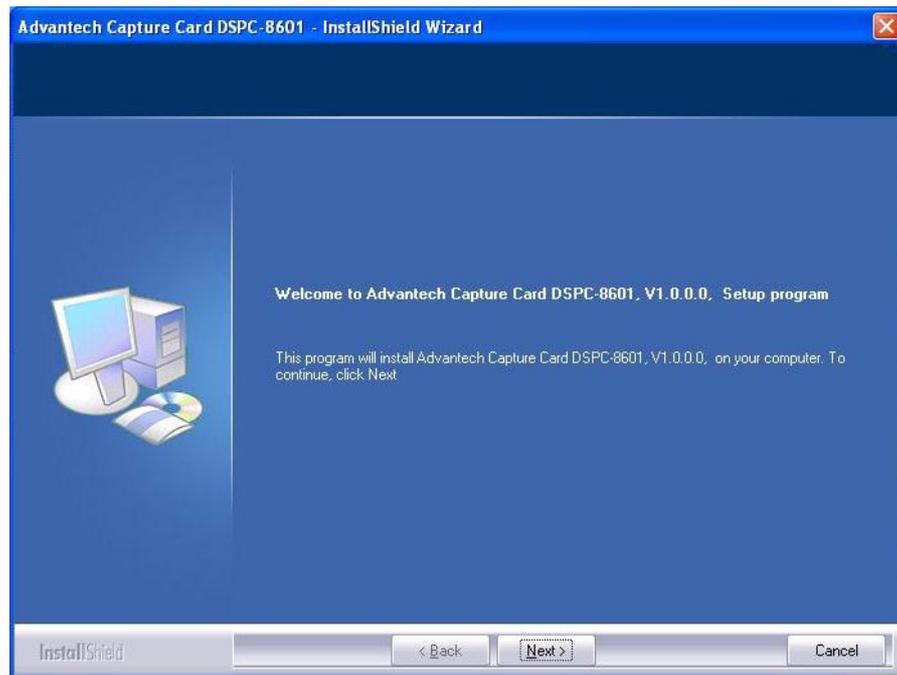
## 3.1 SDK and Driver Installation

DSPC-8601-USBE provides a Software Development Kit (SDK) for application development. Only a DLL version is provided in this SDK currently.

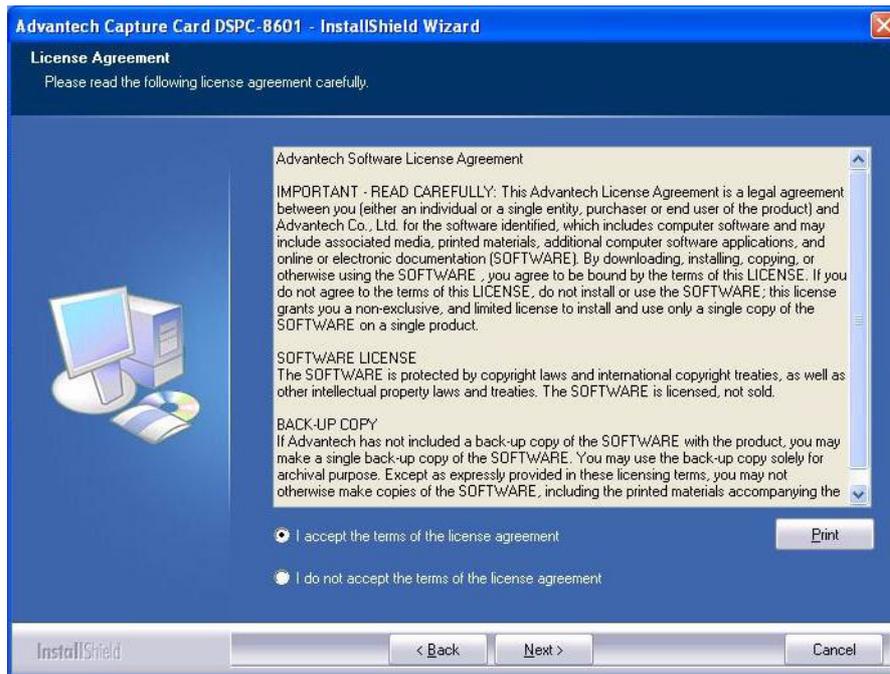
When this device is used under Microsoft Windows XP OS, the device driver needs to be upgraded. Otherwise, some functions will not work correctly. If this device is used under later versions like Windows Vista, Windows 7, then there is no need to install the device driver.

To install the SDK and driver correctly, **please connect the DSPC-8601-USBE device to PC first**. Then execute the file "Advantech\_DSPC8601\_Install.exe" to run the setup program. Follow the instructions below to install the SDK step-by-step.

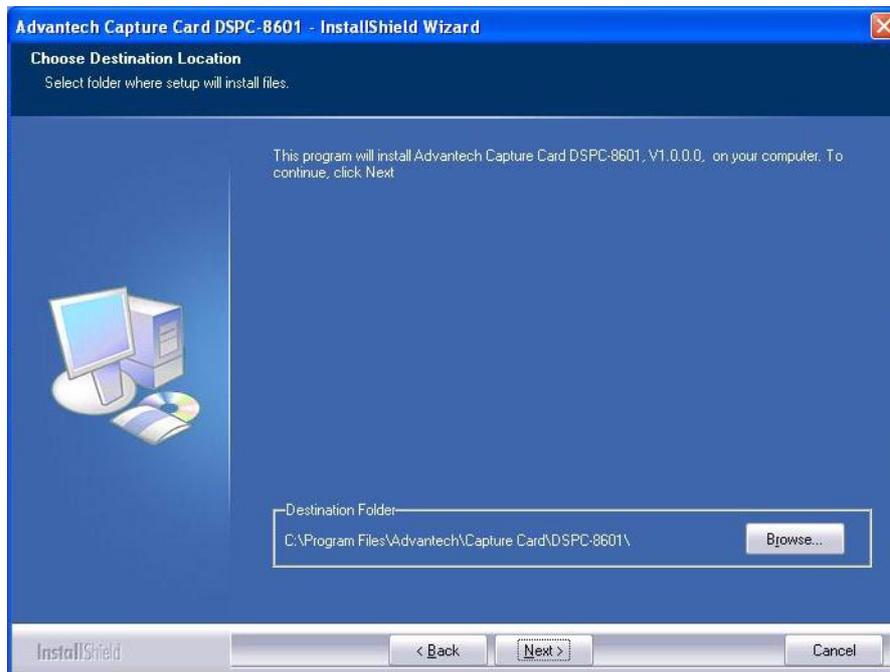
1. Click the **Next** button to continue the setup program.



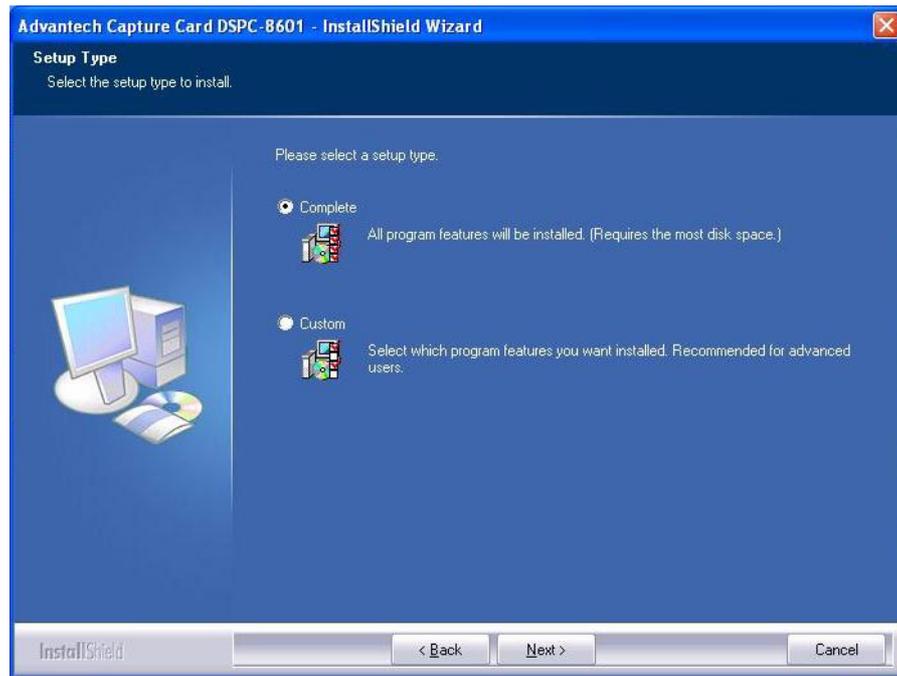
2. Accept the license agreement.



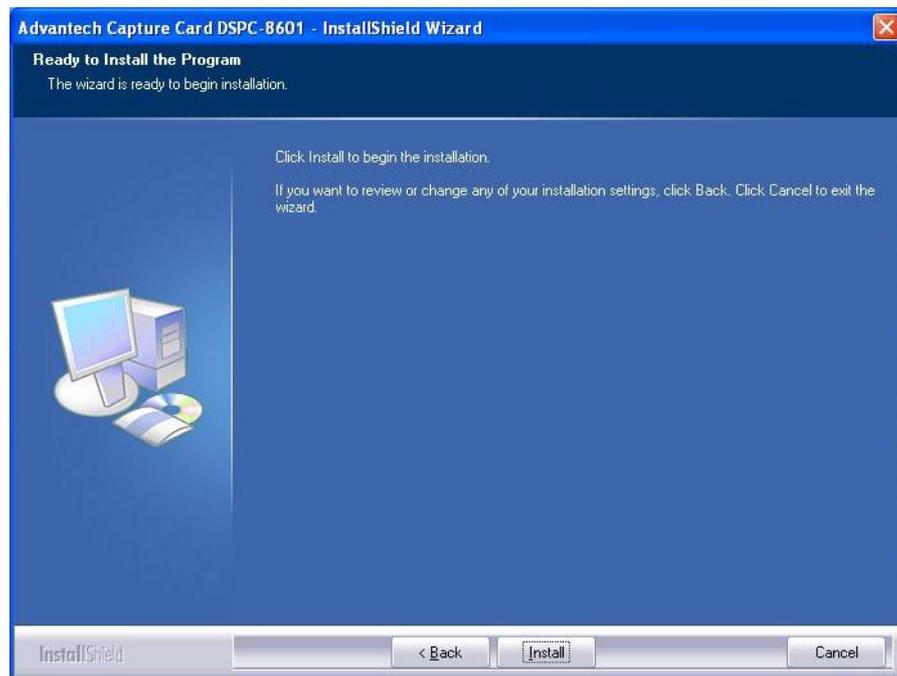
3. The default install path is the folder "C:\Program Files\Advantech\Capture Card\DSPC-8601". Click **Next**.



4. Select the setup type *Complete*.



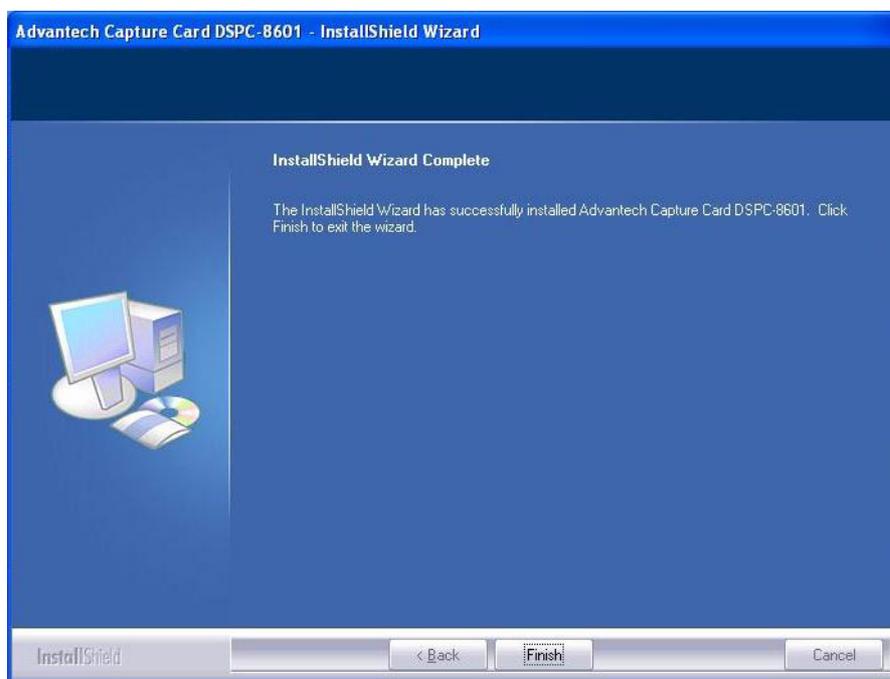
5. Click the **Install** button to start to install SDK.



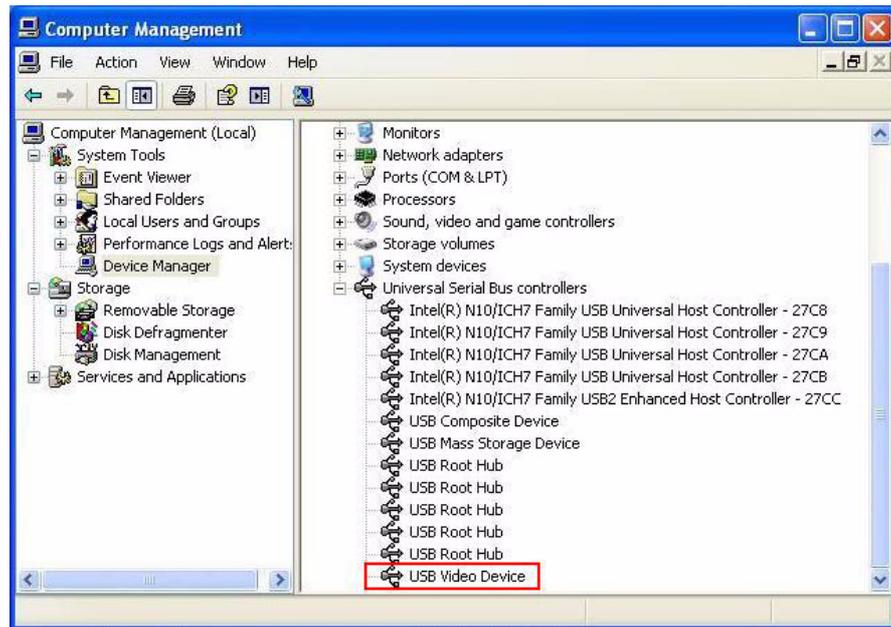
6. After the SDK has installed, the driver install will continue. Just ignore the Windows warnings and click the button **Continue Anyway** to continue to install the device driver.



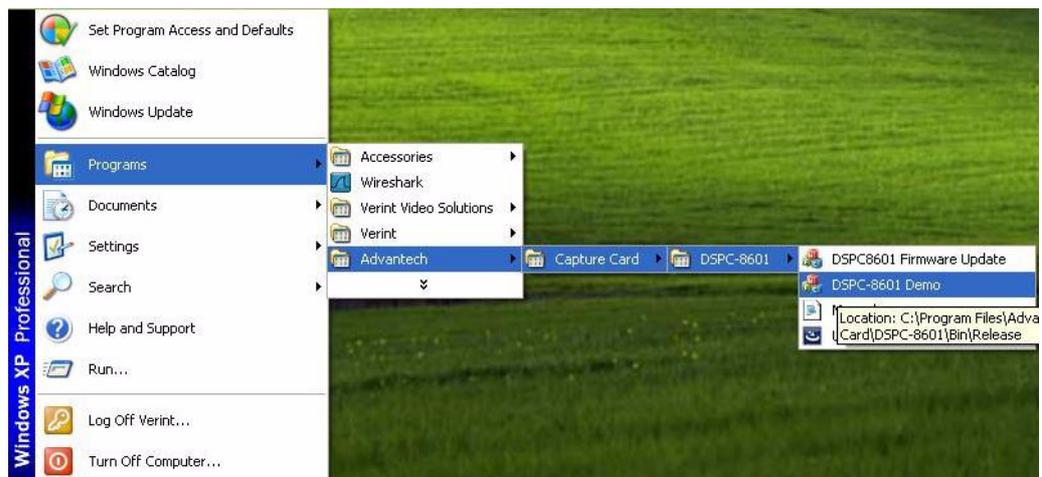
7. Click the **Finish** button to finish the SDK and driver installation.



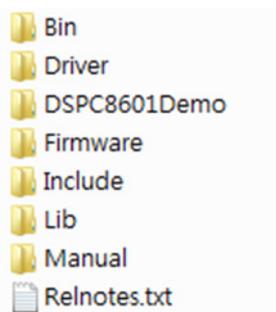
- Under *Device Manager*, “USB Video Device” will be shown if the driver has installed correctly.



- After the SDK has installed successfully, shortcuts will be shown in **Programs**.



The SDK includes the DLL files, device driver, demo application, firmware file, and the SDK user manual. The folders listed below are provided by SDK.



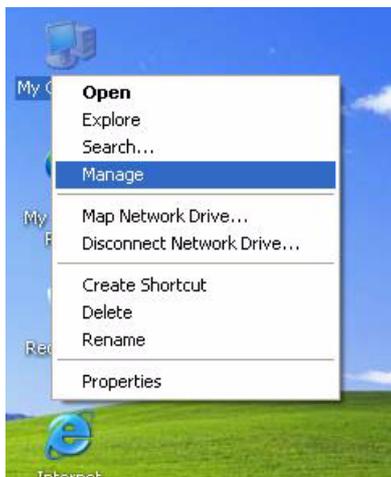
- Bin - Include the execution file of the demo application, SDK DLL files, and the firmware update utility
- Driver - the device driver
- DSPC8601Demo - the sample code of the demo application developed by Microsoft Visual C++ 2008. The user can refer to the code for developing the application
- Firmware - the firmware file, the user can use the program “DSPC8601FWUpdate.exe” to update the firmware
- Include - the header files of the SDK
- Lib - the lib files of the SDK
- Manual - SDK user manual
- Relnotes.txt - show the modification for each version of SDK

## 3.2 Driver Installation Manually

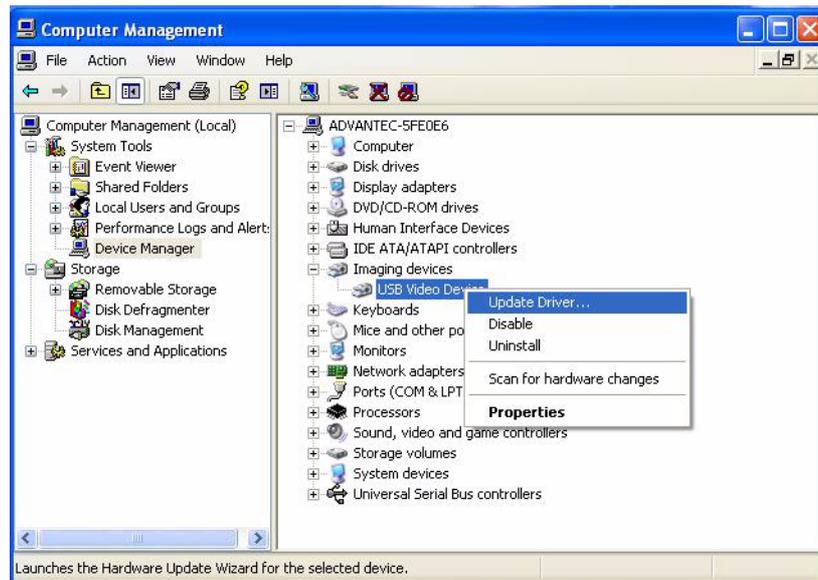
The setup program “Advantech\_DSPC8601\_Install.exe” will install the device driver automatically. The user can also install the device driver manually. This section will describe how to install the device driver manually.

When the device is used under Microsoft Windows XP, the device driver must be upgraded. Otherwise, some functions will not work correctly. The user can follow the steps below to upgrade the device driver manually.

1. Right click the **My Computer** icon, then choose the **Manage** command.



2. Choose **Device Manager**. Right-click **USB Video Device**, and choose **Update Driver**.



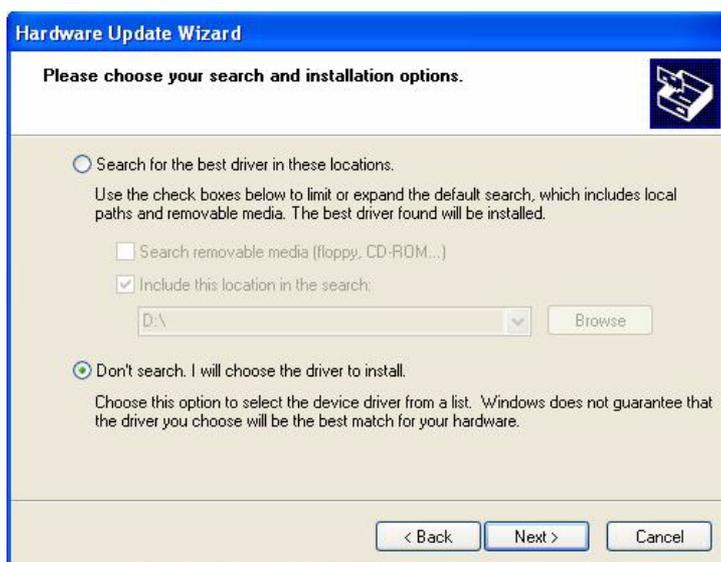
3. Select the **No, not this time**, and click the **Next** button.



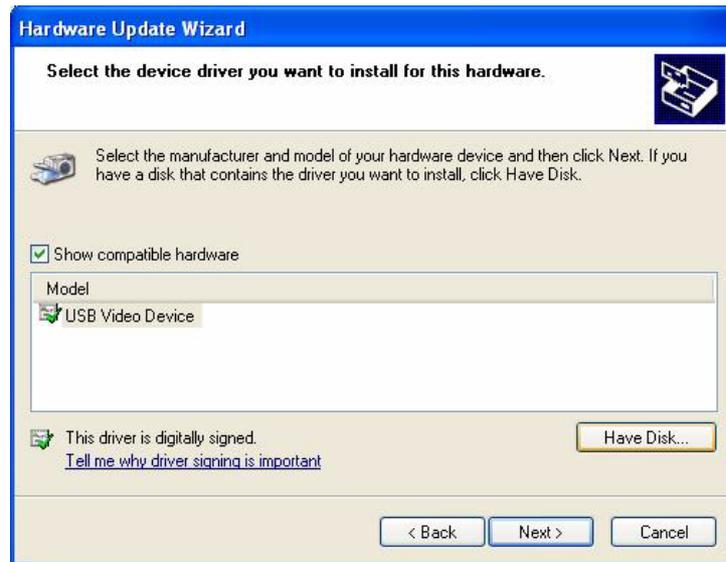
4. Select **Install from a list or specific location (Advanced)**, and click the **Next** button.



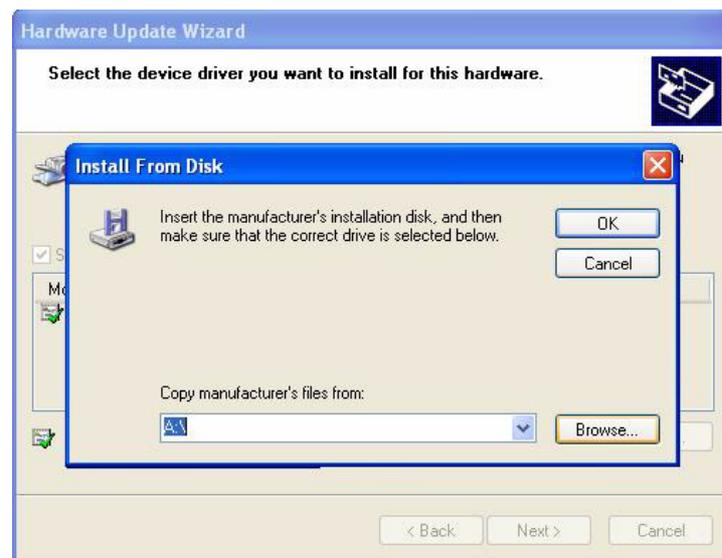
5. Select the **Don't search. I will choose the driver to install**, and click the **Next** button.



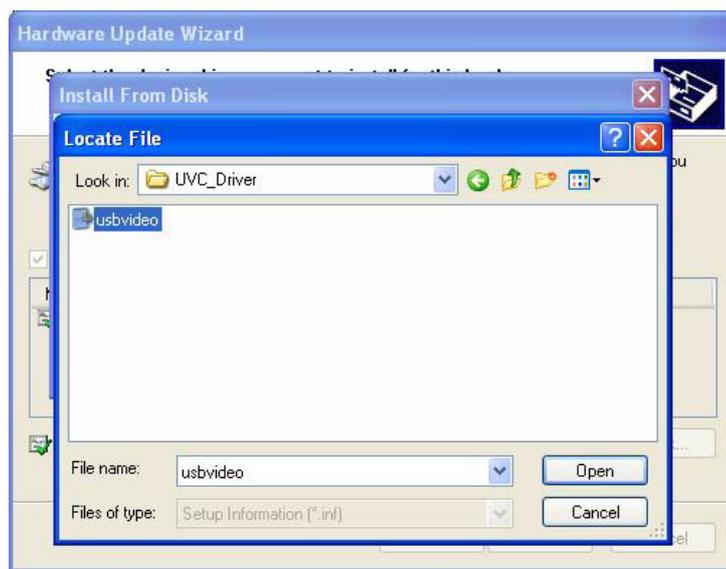
6. Click the **Have Disk...** button.



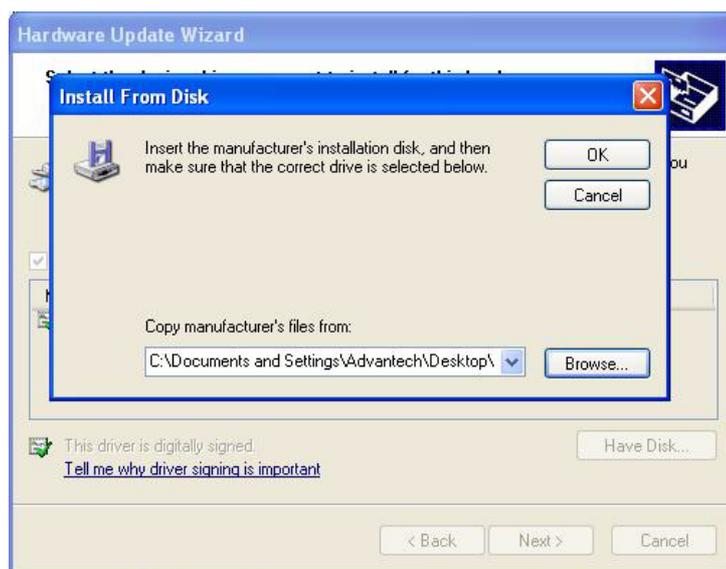
7. Click the **Browse...** button.



- Choose the file “usbvideo.inf” in the “Driver” folder of the SDK, and then click the **Open** button.



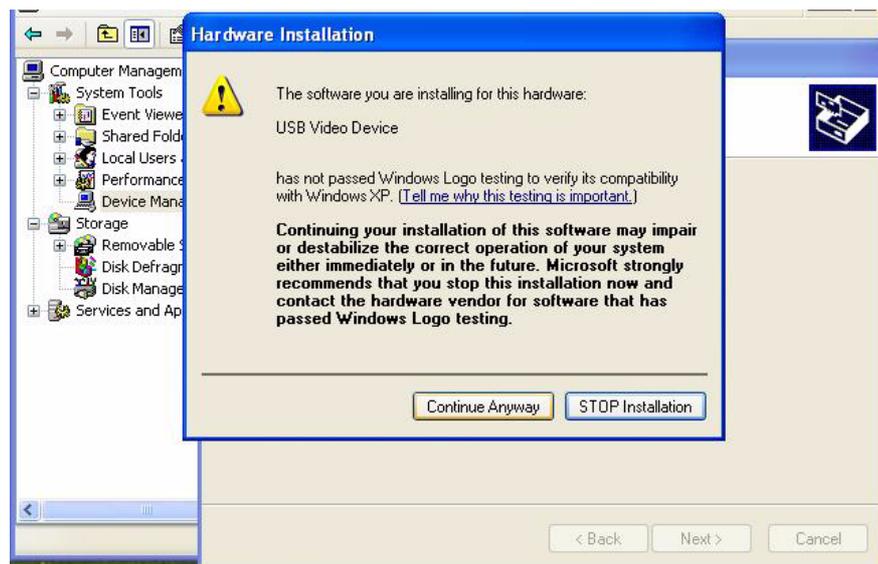
- Click the **OK** button.



10. Click the **Next** button.



11. Click the **Continue Anyway** button.



12. Click the **Finish** button.



13. The driver has been upgraded successfully.

### 3.3 Application Installation

The execution file of the demo application is located in the folder "Bin" of the SDK. Run the file "DSPC8601Demo.exe" to execute the application.

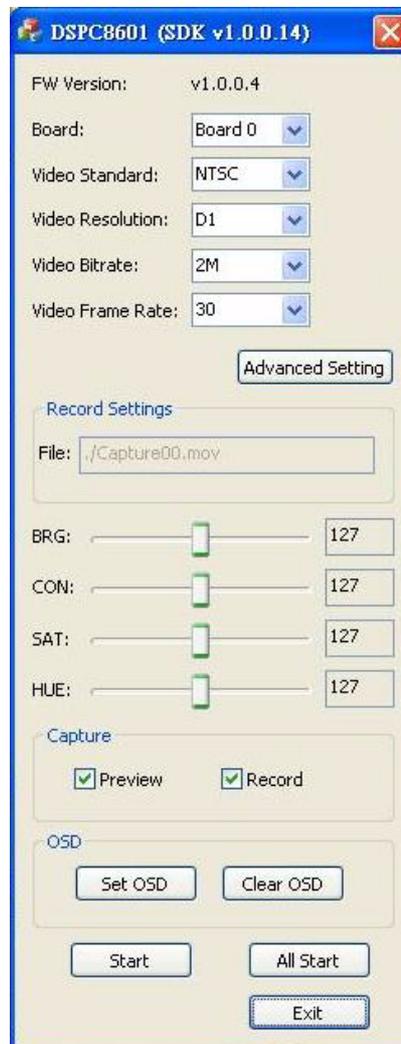


# Chapter 4

Startup

## 4.1 Main Application

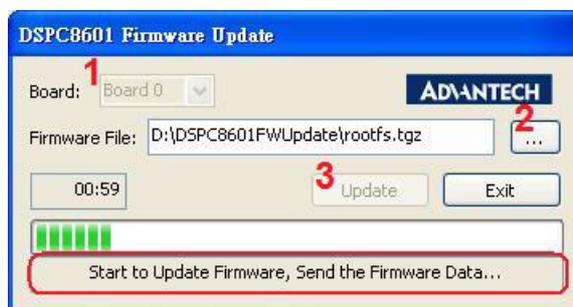
A maximum of 8 DSPC-8601-USB E devices can be supported to connect to one system (with different device ID settings via the Switcher connector. Please refer to Section 1.6.2). Connect DSPC-8601-USB E devices to the system, and wait for around one minute (waiting for the hand-shake between the PC and the USB device) then run the SDK sample program. The application will be shown as follows.



Select the board you want to control from the board option, then click the **Start** button. The video will be shown and recorded into the file “capture.mov”.

## 4.2 Firmware Upgrade Utility

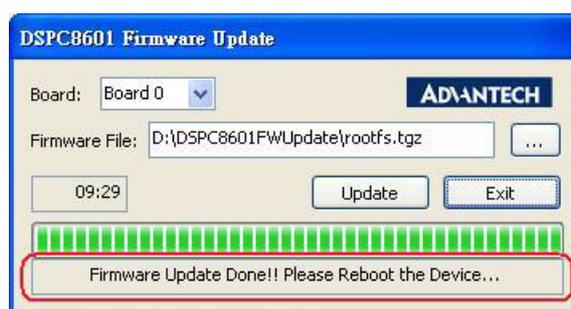
The program “DSPC8601FWUpdate” is an utility to upgrade the firmware into DSPC-8601-USBE. This program is located in the folder “Bin” of the SDK. Please run the “DSPC8601FWUpdate.exe” to execute the program.



1. Select the board number you want to upgrade.
2. Click **Browse** button to select the firmware file.
3. Click **Update** button to start upgrade. A progress bar will show the progress of firmware data transmission.



4. After data transmission, don't unplug the device. Wait until the firmware upgrade has fully finished.



5. Once the system shows the message **Firmware update done!** the firmware upgrade is completed. Now reboot the device.

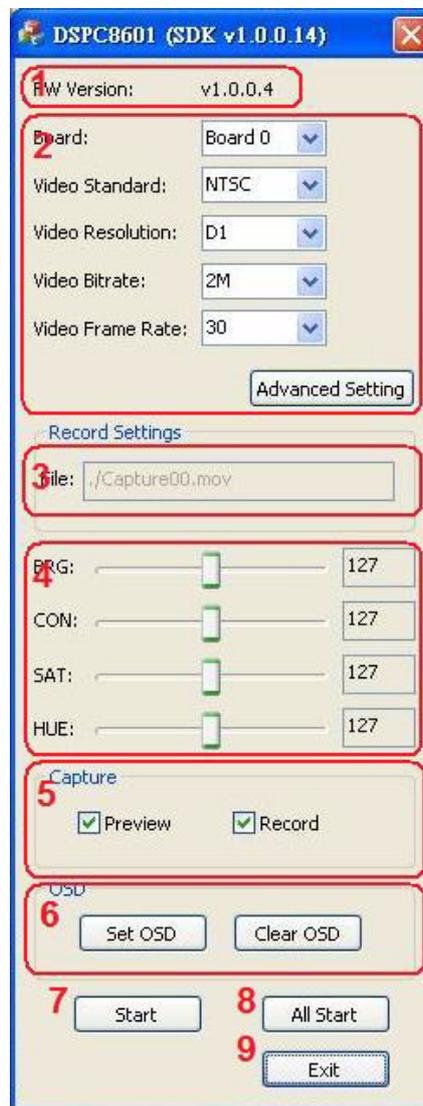


# Chapter 5

## Configuration

## 5.1 Configuration

The demo application provides the options to configure different settings for DSPC-8601-USBE.



1. Shows the current firmware version.
2. Select the board you want to control, and set video standard, video resolution, video bit rate and video frame rate.
3. Shows the file path of the recorded files for each board.
4. Video color setting. The sliders are used to adjust the value of video brightness, contract, saturation and hue.
5. Enable/disable the video preview and record.
6. Set OSD text and clear OSD.
7. Start/stop the capture for the selected board.
8. Start/stop the capture for all boards.
9. Exit the program.

# Chapter 6

Software Development  
Kit

## 6.1 Introduction

The SDK supports two modes, Object mode and API mode, and users can choose either one for the SDK. Both modes are described below. For detailed information for the SDK, please refer to the manual installed with the SDK.

## 6.2 Object Mode

Call the API “DSPC8601\_CreateInstance” to create the IDSPC8601SDK instance for the specified board first. Then users can use the methods for interface IDSPC8601SDK directly. Call method “Release” of IDSPC8601SDK to release all resources when the instance will never be used. A sample code is shown below.

```
int nBoardID = 0;
IDSPC8601SDK * pDSPC8601 = NULL;
if

SPC8601_CreateInstance ( nBoardID, ( void ** )&pDSPC8601 )
{
    pDSPC8601->Open();
    pDSPC8601->Start(
        TRUE,
        FALSE,
        FALSE,
        GetDlgItem( IDC_PREVIEW_DLG )-> GetSafeHwnd(),
        FALSE );
    .....
    pDSPC8601->Stop();
    pDSPC8601->Close();
    pDSPC8601->Release();// Release instance
    pDSPC8601 = NULL;
}
```

## 6.3 API Mode

Call the API “DSPC8601\_Open” to initialize the SDK resources and create the SDK handle. Then call the other APIs by sending the handle to perform the operation. Finally, call API “DSPC8601\_Release” to release the resources of the SDK. A sample code is shown below.

```
int nBoardID = 0;
HANDLE hDSPC8601 = DSPC8601_Open( nBoardID );
if ( hDSPC8601 )
{
    DSPC8601_Start(
        hDSPC8601,
        TRUE,
        FALSE,
        FALSE,
        GetDlgItem( IDC_PREVIEW_DLG )-> GetSafeHwnd(),
        FALSE );

    .....
    DSPC8601_Stop( hDSPC8601 );
    DSPC8601_Release( hDSPC8601 );// Release instance
    hDSPC8601 = NULL;
}
```

---

## 6.4 APIs and Interface

The APIs and interface of the SDK are listed below. For details of the APIs and Interface, please refer the SDK user manual.

1. APIs
  - DSPC8601\_GetSDKVersion
  - DSPC8601\_GetNoOfDevices
  - DSPC8601\_CreateInstance
  - DSPC8601\_GetLastError
  - DSPC8601\_SetLogFile
2. Interface
  - IDSPC8601SDK
    - Release
    - Open
    - Close
    - GetFWVersion
    - Start
    - Stop
    - SetPreview
    - StopPreview
    - SetRawVideoPreview
    - StopRawVideoPreview
    - SetRecord
    - StopRecord
    - IsVideoPresent
    - GetCapState
    - GetVideoStandard
    - SetVideoStandard
    - GetVideoResolution
    - SetVideoResolution
    - GetVideoFrameRate
    - SetVideoFrameRate
    - GetVideoBitRate
    - SetVideoBitRate
    - GetBrightness
    - SetBrightness
    - GetContrast
    - SetContrast
    - GetSaturation
    - SetSaturation
    - GetHue
    - SetHue
    - GetDeInterlaceMode
    - SetDeInterlaceMode
    - GetNoiseReduction
    - SetNoiseReduction

- GetAudioFormat
- SetAudioFormat
- GetAudioChannel
- SetAudioChannel
- GetAudioSamplingRate
- SetAudioSamplingRate
- SetOSD
- ClearOSD
- StartMotionDetection
- StopMotionDetection
- GetStatistics
- SetNewFrameCallback
- SetRawVideoFrameCallback
- SetFrameDecodedCallback
- SetMotionDetectionCallback

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