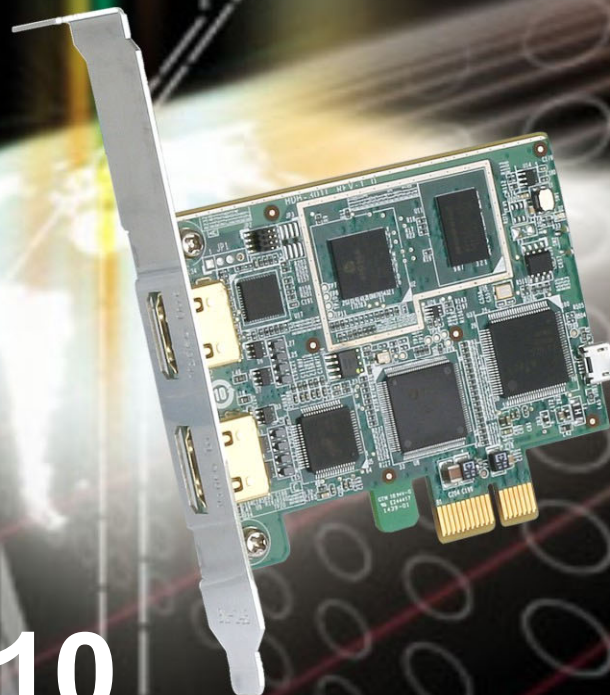**IEI**®

IEI Integration Corp.

MODEL:

HDC-301EL-R10

PCI Express Video/Audio Capture Card with One HDMI Input Channel and One HDMI Output Channel, 1920x1080@30p, H.264 Hardware Encoder

User Manual

Rev. 1.03 – June 26, 2017

RoHS Lead Free

Revision

Date	Version	Changes
June 26, 2017	1.03	Updated IEI HD Capture application
June 2, 2017	1.02	Updated specifications, Chapter 2 and Chapter 3
September 2, 2015	1.01	Added Chapter 4: FAQ
April 2, 2015	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

Table of Contents

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: HDC-301EL Video/Audio Capture Card

The low power HDC-301EL video/audio capture card supports 1080p Full HD video via HDMI connection. The HDC-301EL video/audio capture card is equipped with the high-performing codec component with one HDMI input channel and one HDMI output channel.

A software development kit (SDK) is available and the flexible system architecture simplifies the integration of cameras, video signal processing, storage and video management and or security applications.

1.2 Features

Some of the HDC-301EL video/audio capture card features are listed below.

- Encoding up to 1920x1080@30p
- HDMI input channel with 1920x1080@60p
- Pass through for transmitting uncompressed video up to 1080p resolution
- Capture or record HD video in H.264 format
- Reduce the amount of hard disk space needed by real-time H.264 recording compression capability
- Low power consumption
- Software development kit (SDK)

1.3 Applications

The HDC-301EL can connect to the following devices:

- Game consoles (PS4, Xbox One, Xbox 360)
- DVD / Blue-ray player
- Camcorder
- Industrial video recording devices (marine, in-vehicle, factory or healthcare)

Some possible applications include:

- Video surveillance
- Video analyzer
- Video post production

1.4 Connector Overview

![NOTE icon] **NOTE:**

The other connectors, jumpers and interfaces on the board not specified below are for R&D diagnostic purposes and should not be used by the end user.

The HDC-301EL comes with one HDMI input connector and one HDMI output connector. A PCIe edge connector on the bottom of the capture card enables the HDC-301EL to interface with a motherboard.
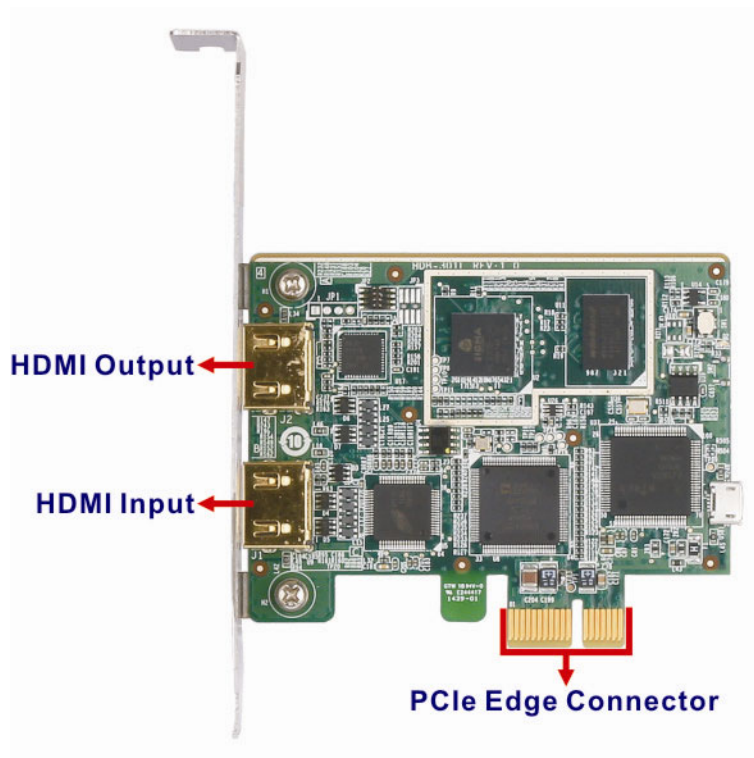
Figure 1-2: HDC-301EL Connector Overview

1.5 Specifications

The HDC-301EL specifications are listed in the table below:

	HDC-301EL
PC Interface	PCI Express x1
INPUT PORT	
Video Input Channel	One
Video Input Type	HDMI
Audio Input Channel	One
Audio Input Type	HDMI (stereo)
NO DELAY HDMI PASSTHROUGH	
Video Output Channel	One
Video Output Type	HDMI
Audio Output Channel	One
Audio Output Type	HDMI (stereo)
VIDEO PROCESSING	
Video Compression	H.264/AVC High Profile Level 4.1 (hardware compression)
Recording Bitrate	Up to 30 Mbps
Input Resolution	1920x1080 24p/25p/30p/50p/60p 1920x1080 60i/59.94i/50i 1280x1024 30p 1280x800 60p 1280x768 60p 1280x720 50p/60p 1024x768 60p 800x600 60p 720x576 50p 720x480 60p 640x480 60p

Recording Resolution	1920x1080 24p/25p/30p 1280x1024 30p 1280x800 60p 1280x768 60p 1280x720 50p/60p 1024x768 60p 800x600 60p 720x576 50p 720x480 60p 640x480 60p
AUDIO PROCESSING	
Sampling Frequencies	44.1 k, 48 kHz
Audio Compression	MPEG-4 AAC
Recording Bitrate	128 kbps
FUNCTIONALITY	
Multiple Card Support	4 cards, 4 channels
Scaling	Video scaling down compression
SYSTEM REQUIREMENTS	
System	2.4 GHz Intel® Core™2 Duo CPU or above
Memory	2 GB or more
OS Environment	**Windows:** Microsoft® Windows® 7/8.1/10 32-bit/64-bit Microsoft® DirectX 10.0c (32-bit) **Linux:** Ubuntu 16.04 (64-bit) (kernel version 4.4.0-21-generic)
SDK	Provides SDK and demo program with sample source code
OTHERS	
Dimensions (WxH)	83.82 mm x 64.41 mm
Operating Temperature	0ºC ~ 60ºC (32ºF ~ 140ºF), non-condensing
Power Consumption	4.5 W

Table 1-1: Specifications

1.6 Dimensions

The dimensions for the HDC-301EL are listed below.
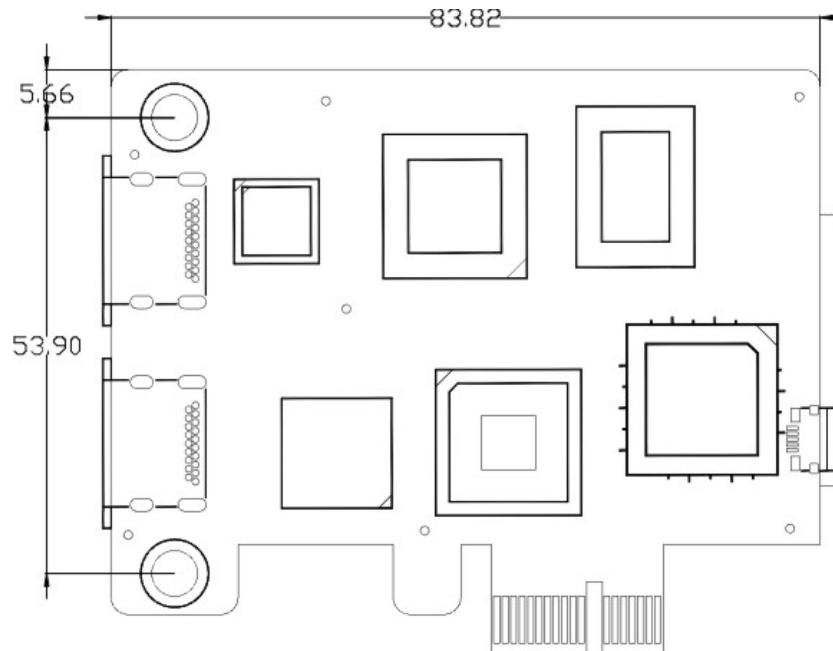
Figure 1-3: HDC-301EL Dimensions (mm)

Chapter

2

Hardware Installation

2.1 Unpacking

2.1.1 Anti-static Precautions

⚠️ **WARNING:**

Failure to take ESD precautions during the installation of the HDC-301EL may result in permanent damage to the capture card and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the video/audio capture card. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the video/audio capture card, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband**: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding**: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad**: When configuring the video/audio capture card, place it on an anti-static pad. This reduces the possibility of ESD damaging the video/audio capture card.
- **Only handle the edges of the PCB**: When handling the PCB, hold the PCB by the edges.

2.1.2 Unpacking Precautions

When the video/audio capture card is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1.1**.
- Make sure the packing box is facing upwards so the video/audio capture card does not fall out of the box.
- Make sure all the components listed in **Section 2.1.3** are present.

2.1.3 Unpacking Checklist

![NOTE icon] **NOTE:**

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the HDC-301EL from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

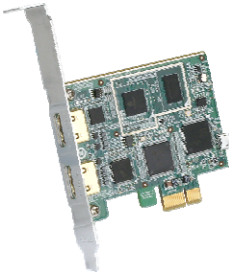The video/audio capture card is shipped with the following components:

Quantity	Item	Image
1	HDC-301EL video/audio capture card	
1	Quick installation guide	

Table 2-1: Package List Contents

2.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the HDC-301EL installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the HDC-301EL on an anti-static pad:
  - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the HDC-301EL off:
  - When working with the HDC-301EL, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the HDC-301EL, **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.

- ▪ Use the product before verifying all the cables and power connectors are properly connected.
- ▪ Allow screws to come in contact with the PCB circuit, connector pins, or its components.

2.3 Video/Audio Capture Card Installation

The HDC-301EL video/audio capture card has a PCIe x1 interface. To install the HDC-301EL, please follow the steps below:

Step 1: Align the PCIe edge connector on the bottom of the video/audio capture card with the PCIe x1 slot on the system motherboard.

Step 2: Gently insert the video/audio capture card into the PCIe x1 slot.

Step 3: Push down gently on the video/audio capture card to make sure it is firmly inserted into the PCIe x1 slot.
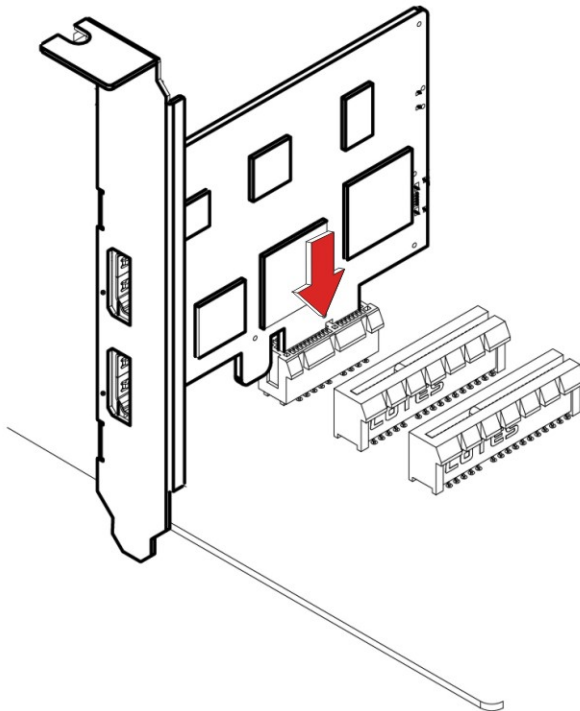

Figure 2-1: HDC-301EL Installation

Step 4: Insert a retention screw through the top of the video/audio capture card external bracket into the chassis to secure the card to the chassis.

2.4 HDMI Devices Installation

Various HDMI devices can be connected to the HDC-301EL, such as the gaming console (PS4, Xbox One, Xbox 360) and camcorder. Follow the steps below to connect the HDMI devices to the HDC-301EL.

Step 1: Use an HDMI cable to connect the HDMI device to the HDMI input connector on the HDC-301EL.

Step 2: Use another HDMI cable to connect the HDMI output connector on the HDC-301EL to the HDMI socket of a monitor/TV.
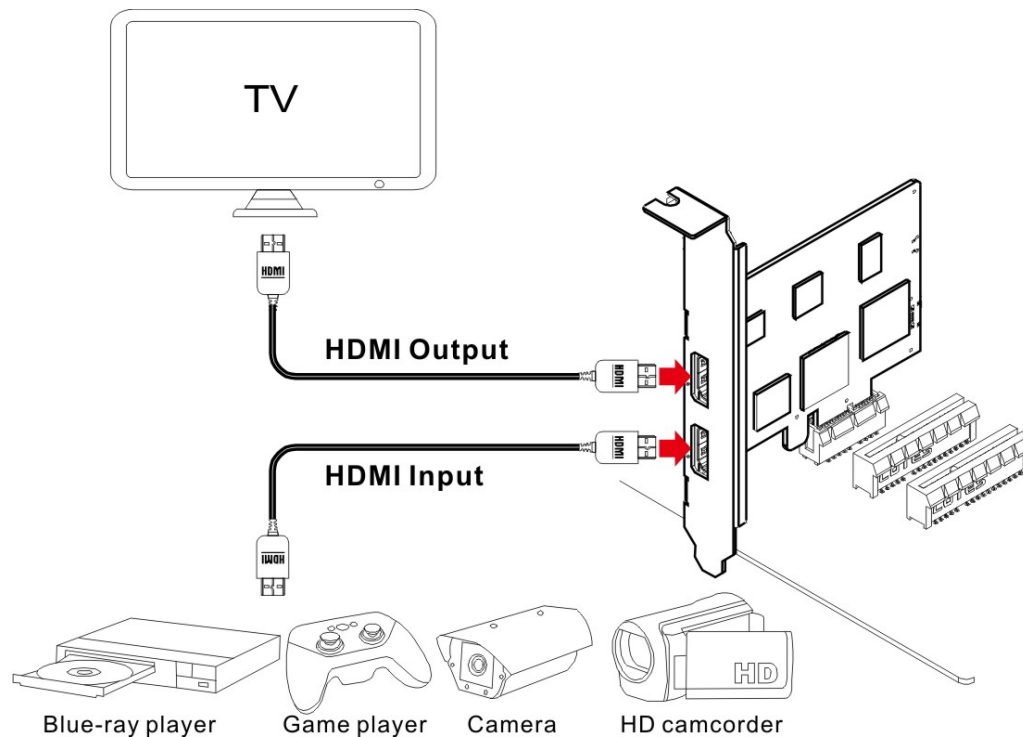

Figure 2-2: Connecting HDMI Devices to the Video/Audio Capture Card

Chapter

3

IEI HD Capture (Windows)

3.1 Software Installation (Windows)

The HDC-301EL comes with a video capture application – IEI HD Capture. This section describes how to install the application in Windows environment.

3.1.1 System Requirements

The supported OS versions are listed below:

- Microsoft Windows 7, 32-bit/64-bit
- Microsoft Windows 8.1, 32-bit/64-bit
- Microsoft Windows 10, 32-bit/64-bit

3.1.2 IEI HD Capture Installation

To install the IEI HD Capture, please follow the steps below:

NOTE:

If the **User Account Control** dialog box appears during installation, click **Yes** to continue.

Step 1: Go to IEI website (http://www.ieiworld.com). Click **Product → Capture Card**. Enter the HDC-301EL page by clicking the product photo.

Step 2: Click the **Download** button on the product page. Find and download the latest IEI HD Capture installer: **IEI_HDCapture_V1xxAD_xxxxxx.exe** (where x is version and date characters).

Step 3: Run the IEI HD Capture installer which will install IEI HD Capture application, the USB to PCIe driver and the device driver.

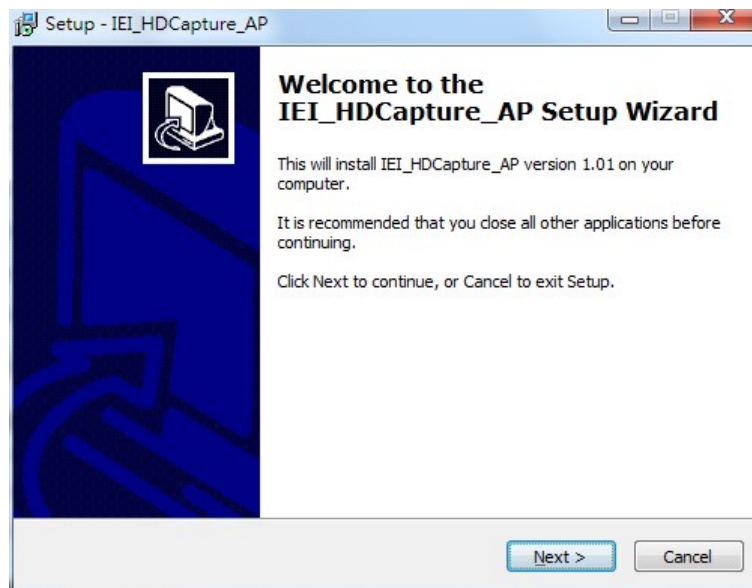**Step 4:** The IEI_HDCapture_AP Setup Wizard appears. Click **Next** to continue.

Figure 3-1: IEI_HDCapture_AP Setup Wizard Welcome Window

Step 5: Select a folder for IEI HD Capture installation as shown in **Figure 3-2**.
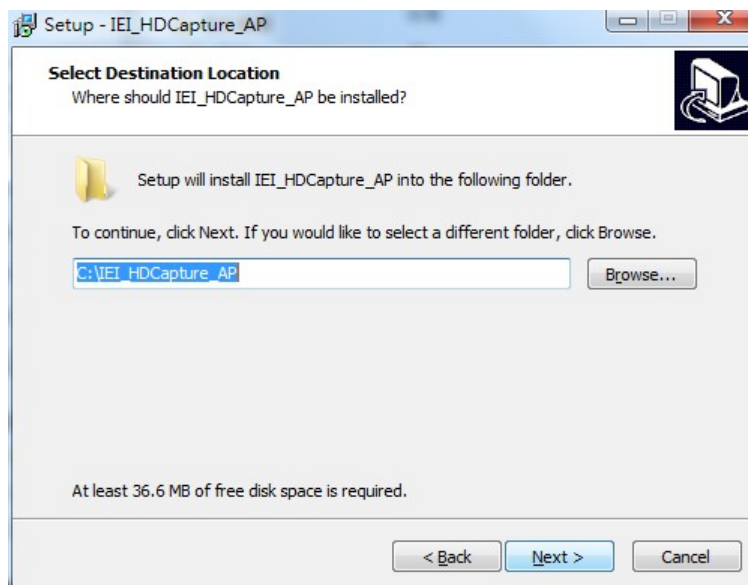
Click **Next** to continue.

Figure 3-2: Select Installation Folder

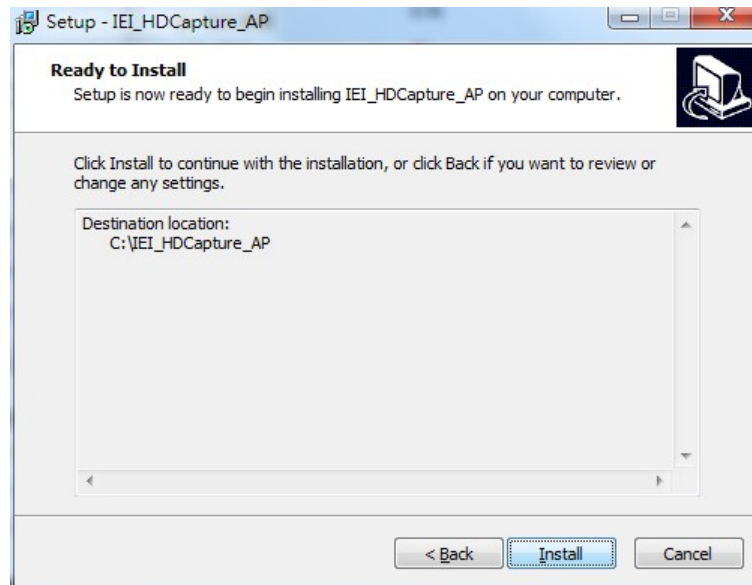**Step 6:** The following screen appears. Click **Install** to confirm the installation.

Figure 3-3: Confirm Installation

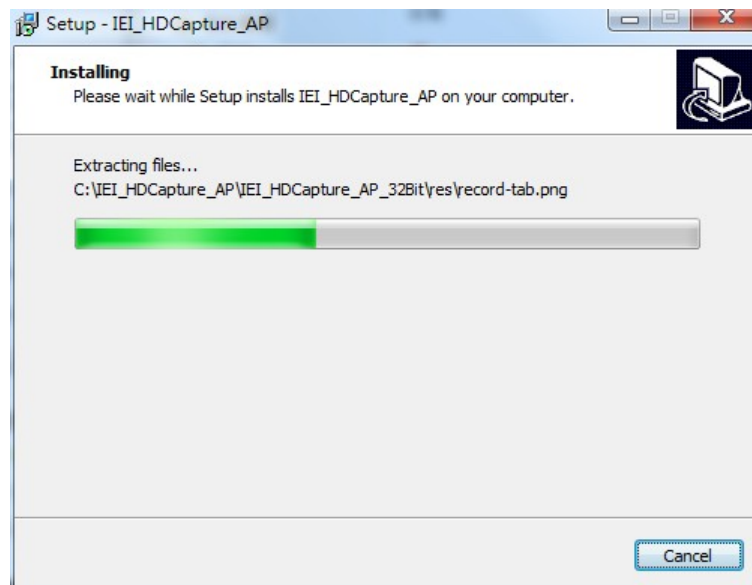**Step 7:** The system starts installing the IEI HD Capture.

Figure 3-4: Installing IEI HD Capture

Step 8: When the IEI HD Capture installation is complete, the following window appears to guide you to install the USB to PCIe driver. Click **Next** to continue.
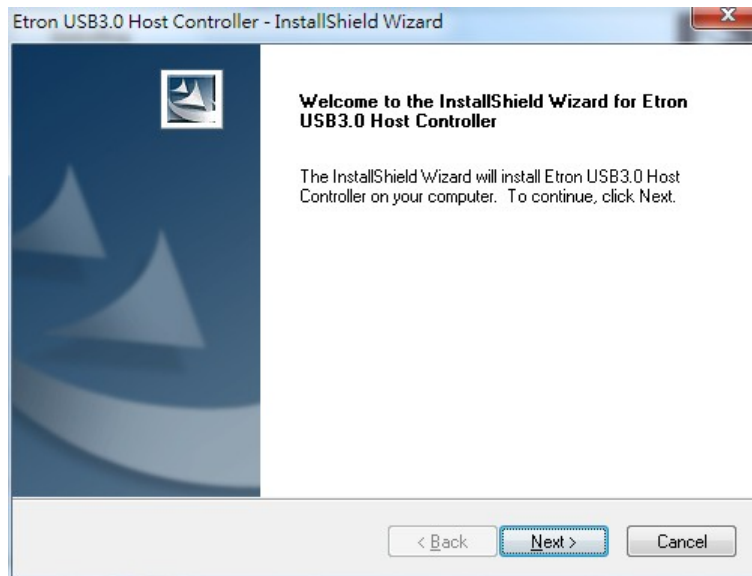

Figure 3-5: USB to PCIe Driver Installation Wizard

⚠️ **CAUTION:**

1. IEI HDC-301MS, HDC-301EL and HDB-301L capture devices use this same installer for software and driver installation. Therefore, the USB to PCIe driver which is needed by the HDC-301EL is also included in the installer package.

2. The program may uninstall your previous installation of Etron USB to PCIe driver during the process. If this happens, run the installer again to re-install the USB to PCIe driver.

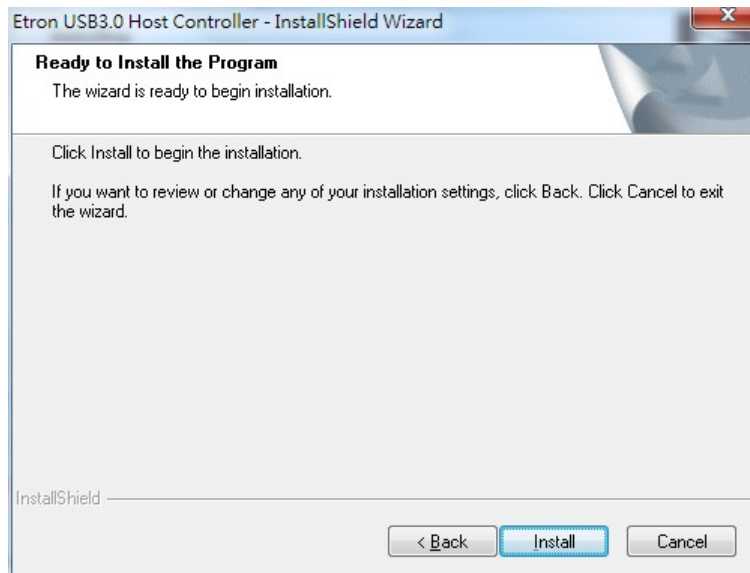**Step 9:** The following screen appears. Click **Install** to confirm the installation.

Figure 3-6: Confirm USB to PCIe Driver Installation

Step 10: When the USB to PCIe driver installation is complete, click the **Finish** button to

finish the USB to PCIe driver installation.
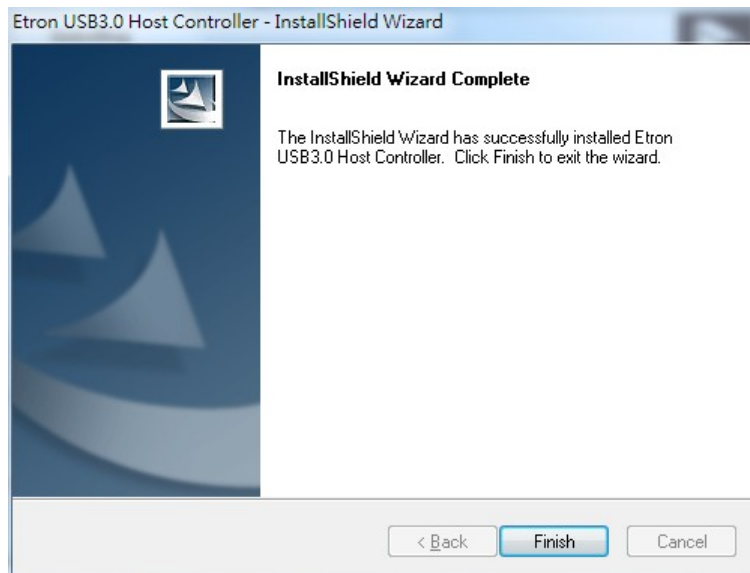
Figure 3-7: USB to PCIe Driver Installation Complete

Step 11: When the USB to PCIe driver is complete, the following window appears to guide you to install the device driver. Click **Next** to start installing the driver.

Figure 3-8: Device Driver Installation Wizard Welcome Window

Step 12: If the following window appears before installation, click **Install** to continue.

Figure 3-9: Window Security

Step 13: The following window appears. Click **Finish** to exit.

Figure 3-10: Device Driver Installation Complete

3.2 Using IEI HD Capture Application
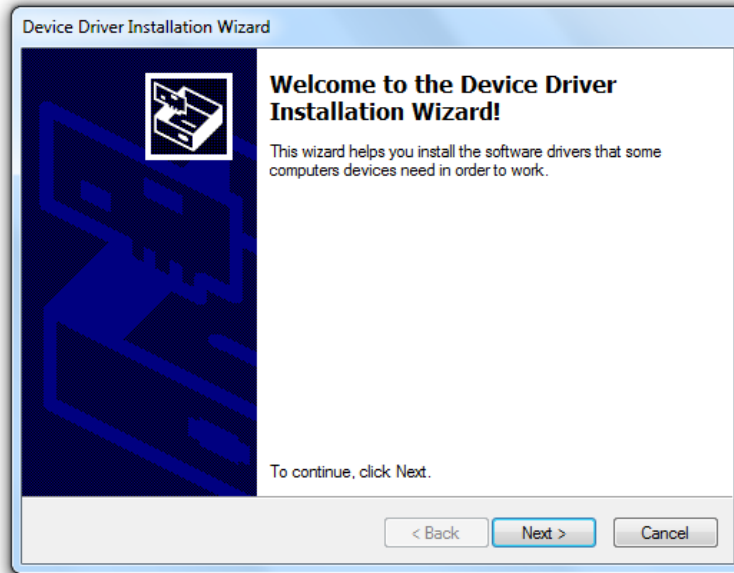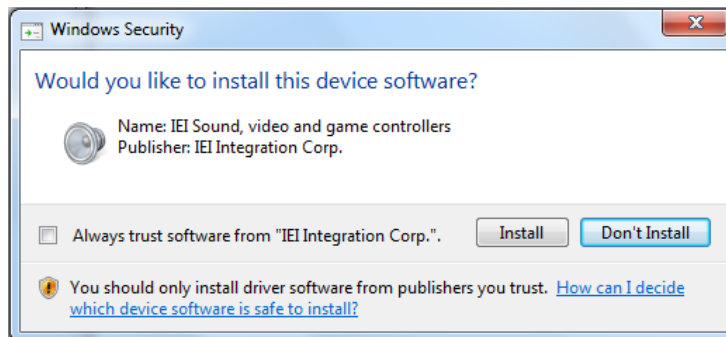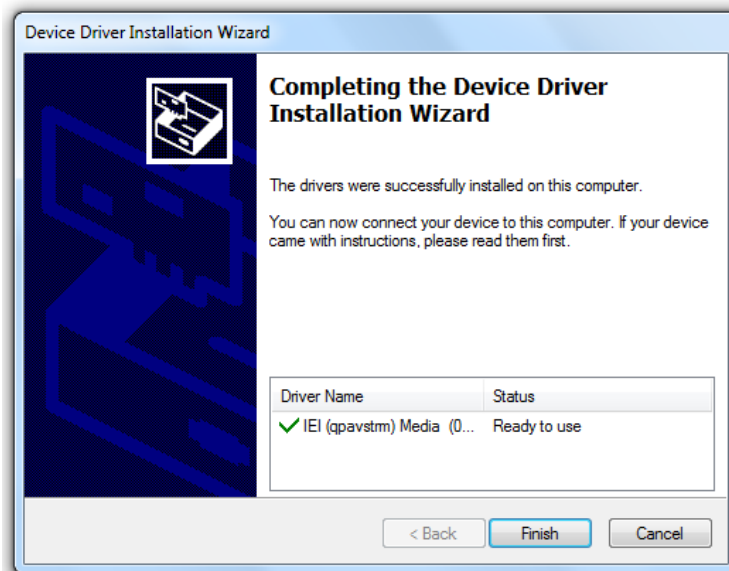
This section describes how to use IEI HD Capture in Windows environment.

3.2.1 IEI HD Capture Interface Overview

Figure 3-11: IEI HD Capture

①	Device: the IEI capture card installed in the computer for capturing video
②	Video Input: displays the video input resolution from the HDMI device
③	Device Audio: adjusts the volume amount for encoding.
④	Recording Resolution: the selected recording resolution
⑤	Recording Quality: the recording quality of the selected recording resolution
⑥	Keyboard shortcut setup
⑦	Software interface language
⑧	Schedule recording to automatically start/stop recording at a specific time
⑨	File Path: the directory to save the encoded video file
⑩	Recorded: displays the elapsed time of the recording
⑪	Record/Stop button
⑫	Click to locate and play a video recorded previously

3.2.2 Capture Video

To use the IEI HD Capture to capture video, follow the steps below.

Step 1: Launch the IEI HD Capture by double-clicking the IEI_HDCaptur e_AP icon on the desktop.

Step 2: The IEI HD Capture user interface appears (See **Figure 3-11**). Follow the instructions described below to make necessary configuration settings.

①　**Device:** Select the model name of the capture card installed in the computer.

③　**Device Audio:** Adjust the volume amount for encoding.
Click to mute audio.

④　**Recording Resolution:** Select a recording resolution. The available recording resolution may vary upon the video input resolution from the HDMI device.

⑤　**Recording Quality:** Drag to set the recording quality of the selected recording resolution.

Step 3: Click button (**Figure 3-11**　⑨) to specify a location to save the encoded video file. The Open Folder window appears. Specify a location to save the encoded video file.

Step 4: To start capturing the video, click the **REC** button (**Figure 3-11**　⑪). IEI HD Capture starts displaying the elapsed time of the recording (**Figure 3-11**　⑩).

Step 5: To stop capturing the video, click button on the IEI HD Capture.

> ⚠ **WARNING:**
>
> Do not use IEI HDC-301EL to record HDCP- or copyright-protected content. Unauthorized use of screenshots or videos may infringe the rights of the copyright owner and violate the law.

3.2.3 Play Video

To use the IEI HD Capture to play the video recorded previously, follow the steps below.

Step 1: Click ![button] button (**Figure 3-11** ⑫) to specify a video recorded previously.

Step 2: The selected video shows on the screen and starts to play.
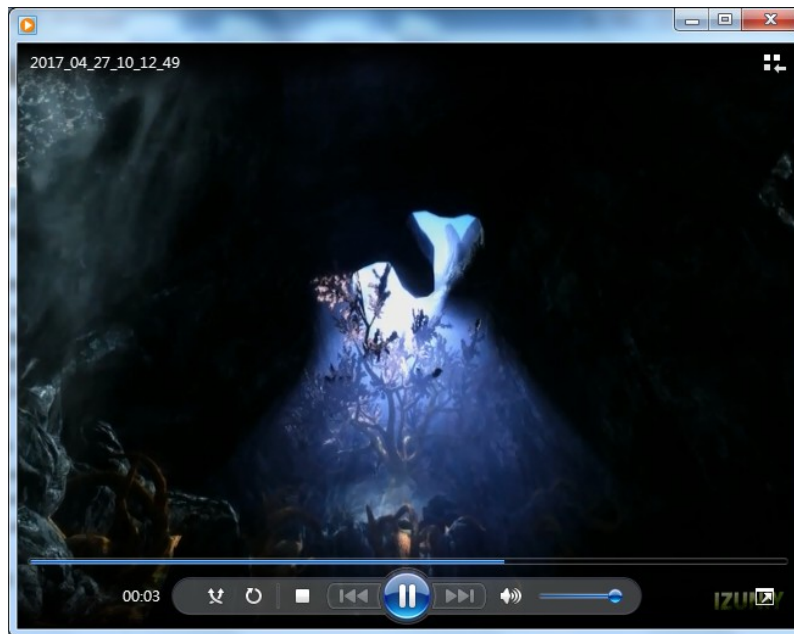
Figure 3-12: Playing the Video

3.2.4 Assign Keyboard Shortcut

The user can assign a keyboard shortcut for the REC button to start recording or stop recording in HD Capture. To assign keyboard shortcuts, following the steps below.

Step 1: Click   button (**Figure 3-11** ⑥). The following window appears.
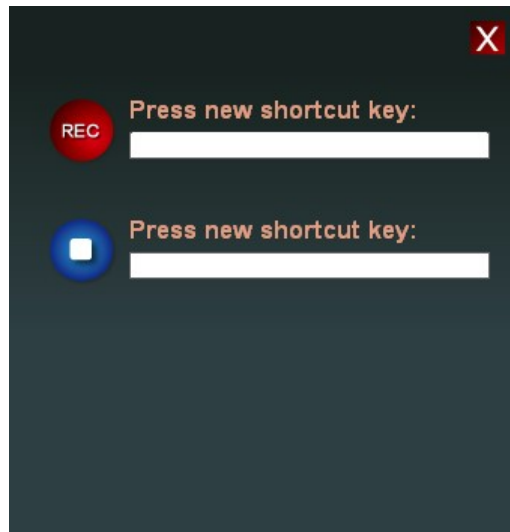
Figure 3-13: Keyboard Shortcut Setup Window

Step 2: Click on the empty field and press the combination of keys that you want to assign.

Step 3: Close the window to save the settings.

> ⚡ **WARNING:**
>
> Do not assign the keyboard shortcuts defined in Windows system (such as Ctrl+C or Ctrl+V) to IEI HD Capture application. Otherwise, it will cause conflict and make the Windows shortcuts stop working while running IEI HD Capture.

3.2.5 Schedule Recording

IEI HD Capture allows users to schedule recording. Users can specify the time for the recording to start and stop, and IEI HD Capture will start automatically at the specified time to perform the recording and stop automatically. To use the IEI HD Capture to schedule recording, follow the steps below.

Step 1: Click the recording schedule tab (**Figure 3-11** ⑧), and the following screen appears.

Figure 3-14: Recording Schedule Screen

Step 2: Click the **New** button to schedule a new recording. The following schedule setting window appears.

![NOTE icon] **NOTE:**

To modify or delete a scheduled recording, select the schedule in the list and click the **Edit** button to modify the settings or click the **Delete** button to delete the schedule.
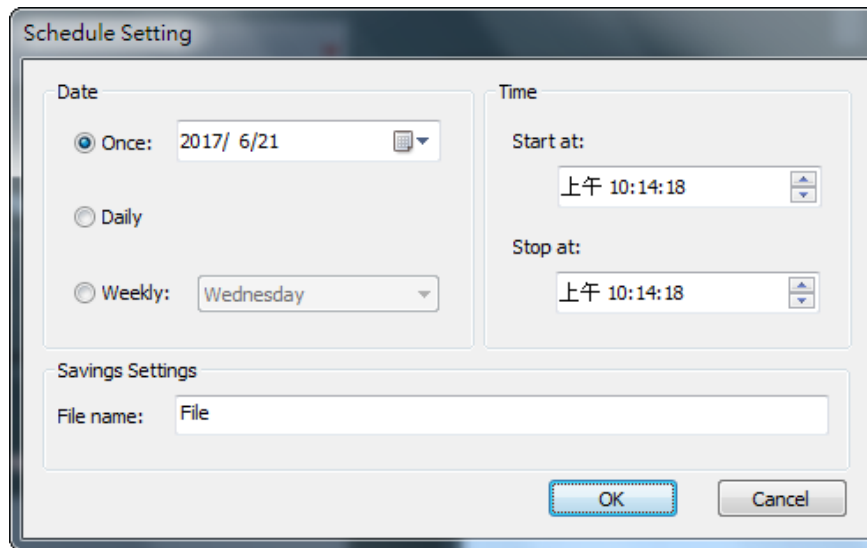
Figure 3-15: Schedule Setting Window

Step 3:   To perform the scheduled recoding for one time, select **Once** and specify the

date on the left side of the window.

To perform the scheduled recoding daily or weekly for the specified duration,

select **Daily** or **Weekly**.

Step 4:   Specify the start time and the stop time on the right side of the window.

Step 5:   Specify the name of the schedule. Click **OK** to save the settings and exit.

NOTE:

- An alert message will prompt when the hard disk space is less than 30 GB; another alert will prompt when the disk space is less than 500 MB.
- The bitrate of the scheduled recording is corresponding to the bitrate set in the recording quality (**Figure 3-11** ⑤).
- The maximum number of scheduled tasks is 336.

Chapter

4

FAQ

Q:	How to play the recorded video of HDC-301EL?
A:	Please use a media player that supports H.264 format, such as VLC. If your media player doesn't support H.264 format, please install H.264 codec to decode the video, for example, ffdshow.
Q:	How to know the current DirectX version used on the system?
A:	In Windows, start Run and type 'dxdiag', then press Enter. You can find the current version in DirectX Diagnostic Tool window.
Q:	How to obtain the latest drivers?
A:	The drivers are included in the IEI HD Capture software. To obtain the latest drivers, please go to IEI website: http://www.ieiworld.com/. Click **Products** → **Capture Card** → **HDC-301EL** → **Download**, and then find and download the latest IEI HD Capture software.
Q:	How to obtain the latest SDK and sample code?
A:	The sample code is included in the SDK. To obtain the latest SDK and sample code, please go to IEI website: http://www.ieiworld.com/. Click **Products** → **Capture Card** → **HDC-301EL** → **Download**, and then find and download the latest SDK and sample code

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

Hazardous Materials Disclosure

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to below table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O
O:　This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T 11363-2006 (now replaced by GB/T 26572-2011) X:　This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T 11363-2006 (now replaced by GB/T 26572-2011)						

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在SJ/T 11363-2006 (现由GB/T 26572-2011取代) 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006 (现由GB/T 26572-2011取代) 标准规定的限量要求。						