MODEL:

# HDx-301 Series SDK (Linux)

**Software Development Kit (SDK) that Facilitates Development of Linux-based Application for HDC-301MS/HDC-301EL/HDB-301L**

# User Manual

**Rev. 1.00 – May 12, 2015**

# Revision

| Date | Version | Changes |
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# Table of Contents

**1 DRIVER AND SDK INSTALLATION ..... 5**

1.1 OVERVIEW ..... 6
1.2 SYSTEM REQUIREMENTS ..... 6
1.3 SOFTWARE INSTALLATION ..... 6
*1.3.1 Bin File Only ..... 6*
*1.3.2 Source Code ..... 7*

**2 USING THE SDK IN LINUX ..... 9**

2.1 LAUNCH IEI HD CAPTURE AP SDK ..... 10
2.2 VIDEO CAPTURE ..... 12
*2.2.1 Encoding Settings ..... 12*
*2.2.2 Update HDMI Source ..... 13*
*2.2.3 Select Other Board ..... 13*
*2.2.4 Change Output ..... 13*
*2.2.5 AES ..... 14*
2.3 MULTI-BOARD CAPTURE ..... 15

**3 LINUX OPEN SOURCE CODE ..... 17**

Chapter

1

# Driver and SDK Installation

## 1.1 Overview

The IEI HD Capture AP SDK is a video capture tool that allows the user to capture video through the HDMI input ports in Linux environment.

This manual includes SDK information for the HDx-301 Series which includes:

- HDC-301MS
- HDC-301EL
- HDB-301L

## 1.2 System Requirements

The following program must be installed in order to use the IEI HD Capture AP SDK in Linux:

- Kernel: Ubuntu 14.04 Distribution (based on Kernel 3.13.0)

## 1.3 Software Installation

To install the IEI HD Capture AP SDK to a system running Linux, please follow the steps in the following sub-sections.

### 1.3.1 Bin File Only

**Step 1:** Copy the **IEI_hdc301xx_0_0_2_0_bin_3.13.0-32-generic_20150428_4172.tar.gz** (0_0_1_9 release version, 20150312 release date, 11851 svn version, 2.6.32-38-generic kernel version) file from the utility CD to the system hard drive. The user can also get the latest version from IEI website.

**Step 2:** Unzip the file by typing:

```
$ tar zxvf IEI_hdc301xx_ (version)_bin_(kernel version) (date)(svn version).tar.gz
$ tar zxvf IEI_hdc301xx_0_0_2_0_bin_3.13.0-32-generic_20150428_4172.tar.gz
```

**Step 3:** Change to SDK directory by typing:

```
$ cd IEI_hdc301xx_ (version)_bin_(kernel version) (date)(svn version)
$ cd IEI_hdc301xx_0_0_2_0_bin_3.13.0-32-generic_20150428_4172
```

**Step 4:** Login as root by typing:

```
$ sudo su
```

**Step 5:** Enter the password:

```
password: ******
$
```

**Step 6:** Install the IEI HD Capture AP SDK by typing:

```
#sh env.sh


root@ubuntu:/home/test/PL330/Linux/trunk/driver/fellini-linux/api/linux# sh env.sh
Reading package lists... Done
Building dependency tree
Reading state information... Done
libsdl1.2-dev is already the newest version.
0 upgraded, 0 newly installed, 0 to remove and 513 not upgraded.
 ----- check OS version ------
ubuntu-10.4-64
x64
/lib/libieiaes.so: ELF 64-bit LSB shared object, x86-64, version 1 (SYSV), dynamically
linked, not stripped



#sh load_pldev300usb.sh


#ls -al /dev/video0
crw-rw----+ 1 root video 81, 0 2015-04-23 00:39 /dev/video0
```

### 1.3.2 Source Code

**Step 1:** Copy the **IEI_hdc301xx_(SDK VERSION)_(RELEASE DATE)_(SVN VERSION).tar.gz** file from the utility CD to the system hard drive. The user can also get the latest version from IEI website.

**Step 2:** Unzip the file by typing:

```
tar zxvf IEI_hdc301xx_(SDK VERSION)_(RELEASE DATE)_(SVN VERSION).tar.gz
tar zxvf IEI_hdc301xx_0_0_2_0_4172.tar.gz
```

**Step 3:** Change to SDK directory by typing:

```
$ cd hdc301xx_(version) /api/linux/
$ cd hdc301xx_0_0_2_0/api/linux/
```

**Step 4:** Login as root by typing:

```
$ sudo su
```

**Step 5:** Enter the password:

```
password: ******
$
```

**Step 6:** Install the IEI HD Capture AP SDK by typing:

```
# sh build.sh
```

**Step 7:** The system starts to install the SDK and shows:

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
libsdl1.2-dev is already the newest version.
0 upgraded, 0 newly installed, 0 to remove and 513 not upgraded.
 ----- check OS version ------
ubuntu-10.4-64
x64
/lib/libieiaes.so: ELF 64-bit LSB shared object, x86-64, version 1 (SYSV), dynamically
linked, not stripped
pldev300usb           565183  0
videodev               40486  1 pldev300usb#
```

Chapter

2

# Using the SDK in Linux

## 2.1 Launch IEI HD Capture AP SDK

**Step 1:** To launch the IEI HD Capture AP SDK in Linux, type “hdctest” as below:

```
$ hdctest
```

**Step 2:** The system starts to launch the SDK.

When the main menu appears, it is ready to use.

```
Build Apr 28 2015 14:15:41
----------------------------------
MCU INFO
SW_VERSION 0.0.2.0
Build Apr 28 2015 14:15:41
----------------------------------
BOARD   DEV     MODEL   FW_VER  IN_HDMI_RES     IN_AUDIO_FREQ   COLOR SPACE     ENC_RES
[ 0]    [ 0]    HDB301L 0.5     I1920X1080P60   A_48K           RGB_LIMITED     O1920X1080P30
[ 1]    [ 2]    HDC301EL 0.1    I1920X1080P60   A_48K           YCRCB_601       O1920X1080P30
[ 2]    [ 3]    HDC301MS 1.0    I1920X1080P60   A_48K           RGB_LIMITED     O1920X1080P30

[97] to capture all video
[99] exit
Select Board Or CMD: 0   <-----  select Board



----------------------------------
MCU INFO
SW_VERSION 0.0.2.0
Build Apr 28 2015 14:15:41
----------------------------------
BOARD   DEV     MODEL   FW_VER  IN_HDMI_RES     IN_AUDIO_FREQ   COLOR SPACE     ENC_RES
[ 0]    [ 0]    HDB301L 0.5     I1920X1080P60   A_48K           RGB_LIMITED     O1920X1080P30
----------------------------------
SW INFO
----------------------------------
 VIDEO:
```

```
 INPUT:
PictureResolution-InPicWidth          1920
PictureResolution-InPicHeight         1080
InputControl-ScanFormat                progressive
InputControl-InFrameRate               60
 OUTPUT:
PictureResolution-OutPicWidth         1920
PictureResolution-OutPicHeight        1080
InputControl-Fmt                       progressive
InputControl-OutFrameRate              30

 AUDIO:
AudioControlParam-SampleRate           48k

-----------------------------------
 SETTING:
30. STREAM DATA : video+audio

-----------------------------------
 TEST:
50. UPDATE HDMI RESOLUTION (if you change source resolution)
58. CHANGE OUTPUT RESOLUTION
60. CAPTURE VIDEO

80. AES Check
81. AES CID Check
-----------------------------------
 OTHER:
98. Select Other Board
99. Exit Program
Please enter the choice>>
```

## 2.2 Video Capture

To configure the encoding settings and capture the video, please refer to the procedures described in the following sections.

### 2.2.1 Encoding Settings

Before capturing the video, please connect the hardware and follow the instructions below to configure the encoding settings.

**Step 1:** Launch the IEI HD Capture AP SDK (refer to **Section 2.1**).

**Step 2:** Type **60** to select “60. CAPTURE VIDEO” from the main menu.

```
60
```

**Step 3:** The following message shows.

```
cmd 60
-- CTRL C to Stop -----------------------------
plstrm video 0 enc config Config0
ofile ./B0_A_HDB301L_I1920X1080P60_O1920X1080P30_RGB_LIMITED_A_48K_20150428_142433_
F0.5_S0.0.2.0.mpg > tmp.log &


 plstrm encoder
----------------------------------
MCU INFO
SW_VERSION 0.0.2.0
Build Apr 28 2015 14:15:41
----------------------------------
BOARD   DEV     MODEL   FW_VER   IN_HDMI_RES    IN_AUDIO_FREQ   COLOR SPACE     ENC_RES
[ 0]     [ 0]    HDB301L 0.5     I1920X1080P60    A_48K        RGB_LIMITED     O1920X1080P30
----------------------------------
SW INFO
----------------------------------
 VIDEO:
 INPUT:
PictureResolution-InPicWidth         1920
```

```
PictureResolution-InPicHeight        1080
InputControl-ScanFormat               progressive
InputControl-InFrameRate              60
 OUTPUT:
PictureResolution-OutPicWidth        1920
PictureResolution-OutPicHeight       1080
InputControl-Fmt                     progressive
InputControl-OutFrameRate             30

 AUDIO:
AudioControlParam-SampleRate          48k

-----------------------------------
61. STOP VIDEO
Please enter the choice>>
```

Type **61** to stop “61. STOP VIDEO”.

### 2.2.2 Update HDMI Source

To update HDMI source resolution, type **50**.

### 2.2.3 Select Other Board

To display main menu, type **98**.

### 2.2.4 Change Output

To change output resolution, type **58**.

```
cmd 58
---------- SELECT OUTPUT   -----------
 3 . 640X480P60
 4 . 720X480P60
 5 . 720X576P50
 6 . 800X600P60
 7 . 1024X768P60
```

```
 8 . 1280X720P50
 9 . 1280X720P60
10 . 1280X768P60
11 . 1280X800P60
12 . 1280X1024P30
13 . 1360X768P50
14 . 1440X900P30
15 . 1680X1050P30
16 . 1920X1080P25
17 . 1920X1080P30
18 . 1920X1080P24
99 . Not Select

99 . Not Select
3

-----------------------------------
MCU INFO
SW_VERSION 0.0.1.9
Build Apr 23 2015 00:46:01
-----------------------------------
BOARD     DEV  MODEL     FW_VER    IN_HDMI_RES    IN_AUDIO_FREQ  COLOR SPACE    ENC_RES
[ 0]   [ 0]  HDB301L 0.5     I1920X1080P60  A_48K          RGB_LIMITED    O640X480P60
```

### 2.2.5 AES

**Step 1:** Type **80** to proceed with board AES check.

```
cmd 80
 - PublicKey:      67 45 8b 6b
 - vid1 :    c6 23 7b 32
 - vid2 :    69 98 3c 64
 - AES pass 0
```

**Step 2:** Type **81** to input custom AES CID Key.

```
please input company id ****:xxxx


 - cid:       x x x x
 - PublicKey:      73 48 33 66
 - vid1 :     51 dc b0 74
 - vid2 :     ff 5c 49 19
- AES pass 0
```

## 2.3 Multi-Board Capture

**Step 1:** Type **97** from the main menu to encode board 0 ~ 2.

```
----------------------------------
MCU INFO
SW_VERSION 0.0.2.0
Build Apr 28 2015 14:15:41
----------------------------------
BOARD    DEV    MODEL    FW_VER  IN_HDMI_RES    IN_AUDIO_FREQ    COLOR SPACE    ENC_RES
[ 0]    [ 0]    HDB301L 0.5    I1920X1080P60    A_48K        RGB_LIMITED      O1920X1080P30
[ 1]    [ 2]    HDC301EL 0.1    I1920X1080P60    A_48K        YCRCB_601        O1920X1080P30
[ 2]    [ 3]    HDC301MS 1.0    I1920X1080P60    A_48K        RGB_LIMITED      O1920X1080P30


[97] to capture all video
[99] exit
Select Board Or CMD:
```

**Step 2:** Type **98** to stop encoding.

```
Select Board Or CMD:97


[0] start
[1] start
[2] start
-- Key 98 to Stop -----------------------------
```

**Step 3:** The encoding is stopped and the file names are shown.

```
-- Stop ----------------------------


[0]B0_A_HDB301L_I1920X1080P60_O1920X1080P30_RGB_LIMITED_A_48K_20150428_143835_F0.
5_S0.0.2.0.mpg
[1]B1_A_HDC301EL_I1920X1080P60_O1920X1080P30_YCRCB_601_A_48K_20150428_143835_F0.1
_S0.0.2.0.mpg
[2]B2_A_HDC301MS_I1920X1080P60_O1920X1080P30_RGB_LIMITED_A_48K_20150428_143835_F
1.0_S0.0.2.0.mpg
```

Chapter

3

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Linux Open Source Code

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