IEI Integration Corp.

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

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RoHS Lead Free

Revision

Date	Version	Changes
September 2, 2015	1.00	Initial release

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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_2_0 release version, 20150428 release date, 4172 svn version, 3.13.0-32-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

Linux Open Source Code

Linux Open Source Code

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