Vision SDK TDA3xx

3D Surround View

User Guide

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1 Introduction

Vision Software Development Kit (Vision SDK) is a multi-processor software development package for TI’s family of ADAS SoCs. The software framework allows users to create different ADAS application data flows involving video capture, video pre-processing, video analytics algorithms, and video display. The framework has sample ADAS data flows which exercises different CPUs and HW accelerators in the ADAS SoC and demonstrates how to effectively use different sub-systems within the SoC. Frame work is generic enough to plug in application specific algorithms in the system.

Vision SDK demonstrates 3D surround view on TDA3xx via demo application (usecase). This document details various aspects of establishing 3D Surround View on TDA3xx & EVM. SRV refers to 3D surround view in this document.

This document is applicable for Vision SDK versioned 2.9 and greater.

1.1 References

Refer the below additional documents for more information about Vision SDK

Document	Description
VisionSDK_ReleaseNotes.pdf	Release specific information
VisionSDK_UserGuide_TDA3xx.pdf	This document. Contains install, build, execution information
VisionSDK_ApiGuide.CHM	User API interface details
VisionSDK_SW_Architecture.pdf	Overview of software architecture
VisionSDK_DevelopmentGuide.pdf	Details how to create data flow (s) & add new functionality

2 System Requirements

VisionSDK_UserGuide_TDA3xx.pdf documents detailed pre-requisites to use Vision SDK, the following sections lists SRV demo application specific requirements.

2.1 Hardware

2.1.1 Camera Modules

Below listed are the camera modules supported in 3D SRV demo application. SRV application would require 4 number of camera modules. Note that all camera modules used should be same. (i.e. it's not possible to have 2 TIDA-00262 modules and 2 IMI OV10640 modules)

2.1.1.1 TIDA-00262

Is based on Aptina's AR0140AT sensor and uses TI's FPD Link III to transmit uncompressed digital data (uses DS90UB913A-Q1). http://www.ti.com/tool/TIDA-00262

2.1.1.2 IMI OV10640 (RDACM24A)

Is based on Omnivision's OV10640 sensor and uses TI's FPD Link III to transmit uncompressed digital data (DS90UB913A-Q1). http://www.global-imi.com/media/2015/10/Generic-Minicube-Catalogue-1020151.pdf

2.1.2 Aggregator

Above described camera modules terminate into a aggregator (UB960/UB964 EVM), which receives 4 independent uncompressed video stream via FPD Link III and encodes the same into 4 virtual channels on a single mipi CSI2 interface.

Please contact your Texas Instruments representative for details.

2.1.3 MicroSD

These demo application stores, retrieve multiple look up table (LUT's) to / from mmc/sd. A micro MMC/SD would be required and holds couple of LUT's. The details of LUT's are detailed in following pages. Refer section 3 for details. It's recommended to use mmc/sd with speed rating UHS 1 or greater.

2.1.4 Mounting of Camera modules

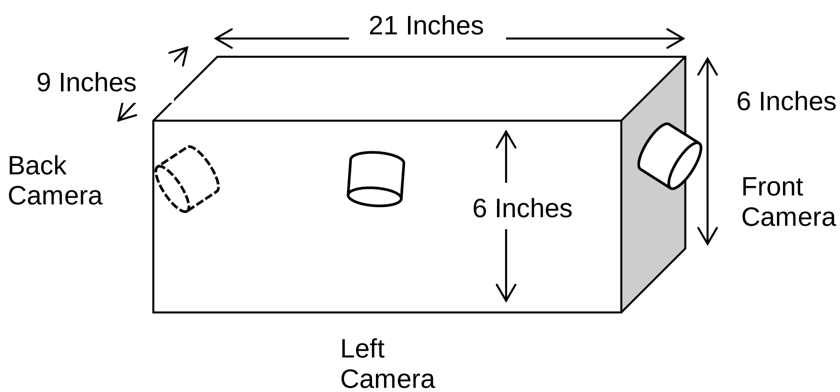
The cameras are to be mounted at 4 end points of a car, as show in picture below Figure 1. Note that each of cameras is approx. at the center of side of the jeep and facing the ground plane. It's recommended that the camera be inclined at 45°. Also ensure the following mapping is maintained.

Camera	Channel
Front	0
Right	1
Back	2
Left	3

Calibration use case could be used to visually identify and map the channel. Please refer section 5 for details.

Figure 1 Camera Mounted on a Toy Jeep

It's not mandatory to mount these cameras on a car; the car could be a rectangular block, as shown below. Camera could be mounted as show, while doing so, please ensure the length/width is maintained.



2.1.5 Connecting UB960/UB964 with TDA3xx EVM

Please refer the TDA3xx user guide, the procedure to connect and configuring UB960 EVM/UB964 EVM to source 9 volts on the FPD Link III is detailed.

2.1.6 Calibration Chart

To caliber the SRV, cameras require reference points / images to determine required corrections. A reference chart is provided in vision_sdk\apps\tools\surround_vision_tools\docs\poster_calib_chart.pdf, please print the chart and place the jeep in specified position.

2.2 Software

This section list the optional software required for calibrating SRV. These are in addition to software requirements specified in the TDA3xx user guide.

2.2.1 Turn on Lens Shading Correction (LSC)

By default the LSC is turned OFF, for optimal image quality (of the stitched output), LSC requires to be turned ON, steps below details changes required.

- In folder `vision_sdk\apps\src\rtos\iss\src\sensor\ov10640`
- Copy the file `ov10640_dcc_lscEnabled.h` to `ov10640_dcc.h`
- Re Build vision SDK, ensure to set the flag `BUILD_DEPENDANCY_ALWAYS` to yes in `Rules.make`

2.2.2 PC based calibration tool (Optional)

1. When calibrating SRV, offline intervention might be necessary. This is done via a PC based tool. Calibration tool is available as part of Vision SDK release under the folder `\vision_sdk\apps\tools\surround_vision_tools\3d_calibration_tool`. Detailed Instructions for offline calibration are provided in "VisionSDK_UserGuide_3D_SurroundView_Manual_CalibTool.pdf" under "`\vision_sdk\docs\SurroundView\`".

3 Various Tables stored in mmc/sd

Please follow the steps prescribed in TDA3x user guide to format the mmc/sd card and create a folder named TDA3X.

All the required LUTs are present in the Vision SDK release under `\vision_sdk\apps\tools\surround_vision_tools\Srv_LUTs\TDA3X`, please copy the LUTs required for the demo in mmc/sd under TDA3X folder.

Note: If you are working with a 128MB DDR build you need to use `\vision_sdk\apps\tools\surround_vision_tools\Srv_LUTs\TDA3X_128MB_DDR`. This is because only 15 view points can be supported with the available memory.

3.1 SRV Demo

The SRV demo requires tables to be stored in mmc/sd under the folder TDA3X, namely. Please ensure that these tables are present, before demo is started.

1. **LUT_IDX.BIN**: This file defines the number of view-points, set details, offset and size for each view point parameter defined in LUT_SETx.BIN
2. **LUT_SETx.LZ4**: These files contain the following compressed information for the view points in a particular set.
    - Width, height, block width, block height and other configurations
    - LDC LUT, for each camera
    - Blend Table
3. **CARIMAGE_IDX.BIN**: This file defines the size, offset and set details for all view point that are compressed and stored in sets of some user-defined size.

4. **CARIMAGE_SETx.LZ4**: These files contain the compressed Car Image for each view point which lies within that set.

3.2 Calibration Demo

The Calibration Demo would require minimum 2 tables to be stored in mmc/sd under the folder TDA3X. Please ensure that these tables are present, before demo is started.

1. **V2W_IDX.BIN**: This file defines the number of view-points and offset for each view point. These offsets are used to read various view point parameters in V2W.LZ4
2. **V2W.LZ4**: This file contains the following compressed information for each view point
   - View 2 World Table, for each camera
   - Width, height, block width, block height and other configurations

3.3 Calibration Demo in Manual mode

When manual / PC based tool is used for the calibration, there could two more files present/required in mmc/sd

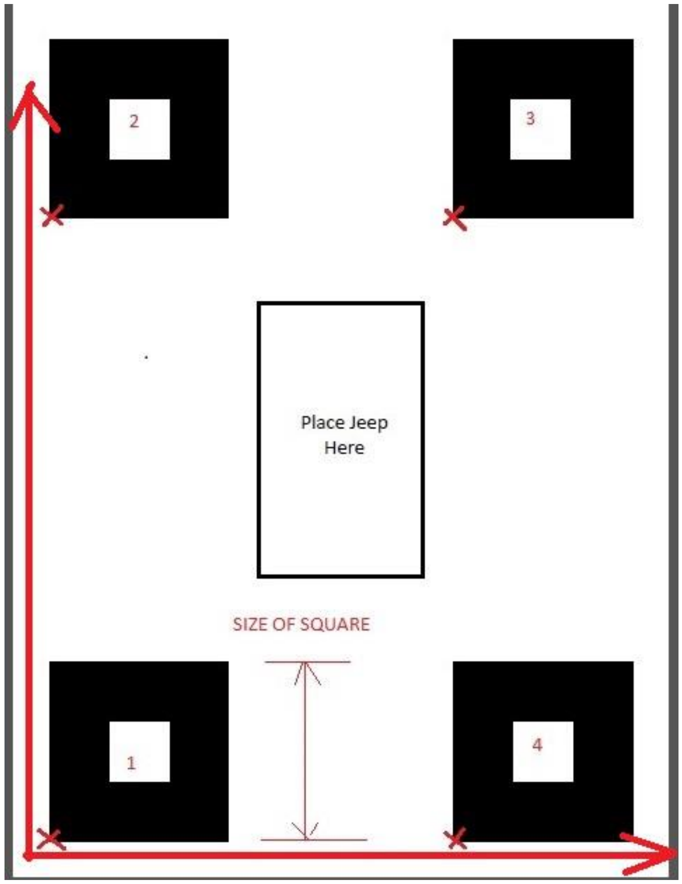
1. **FRONT_0.YUV, RIGHT_0.YUV, BACK_0.YUV & LEFT_0.YUV**: These are frames captured from respective cameras. These would be written by demo application and would be required by the PC based tool for the calibration.
2. **CALMAT.BIN**: Written by the PC based calibration tool. Once the PC based calibration is successful, CALMAT.BIN would be generated. Please copy the same to mmc/sd in TDA3X folder.

3.4 Calibration Demo in Auto Mode

For Auto Calibration the jeep/car with the four cameras mounted on it is required to be placed at the center of the life size print of the calibration chart. The sample chart 'poster_calib_chart.pdf' is present in '`vision_sdk\apps\tools\surround_vision_tools\docs`' directory.

The 'TDA3X' directory on the MMC/SD card should contain the CHARTPOS.BIN file. This file should have the following format with the **actual dimensions** of the chart used for calibration:

- 4 bytes :Number of cameras
- 124 bytes :Header
- 4 bytes :Size of the square in mm
- 8 bytes :Co-ordinates of the bottom left corner of Chart 1 in mm
- 8 bytes :Co-ordinates of the bottom left corner of Chart 2 in mm
- 8 bytes :Co-ordinates of the bottom left corner of Chart 3 in mm
- 8 bytes :Co-ordinates of the bottom left corner of Chart 4 in mm

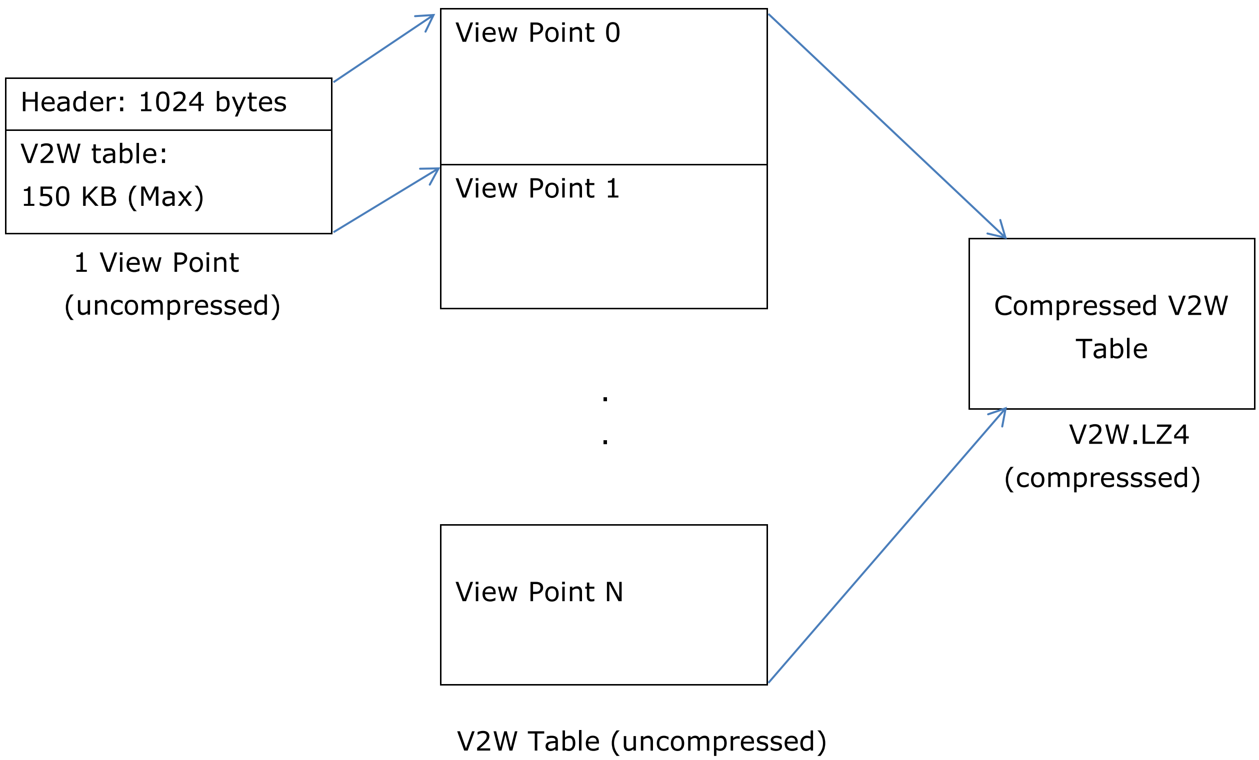


A sample CHARTPOS_HUMMER.BIN used for Hummer jeep is provided at '\vision_sdk\apps\tools\surround_vision_tools\Srv_LUTs\TDA3X'

3.5 Format of V2W.LZ4 and V2W_IDX.BIN files

The V2W.LZ4 file contains the following data sections for every view point.

- 1024 bytes header of the view point
- 150 KB (Max) of V2W table of the view point



The View Point Header has the following structure format defined in the '\vision_sdk\apps\include\alglink_api\algorithmLink_srvCommon.h' file:

```
typedef struct
{
    UInt32  viewPointId;
    /**< An unique ID identifying the view point */
    UInt32  numCameras;
    /**< Number of cameras from which video is being captured */
    UInt32 srvOutputWidth;
    /**< Surround View Output Width */
    UInt32 srvOutputHeight;
    /**< Surround View Output Height */
    UInt32 srvSubSample;
    /**< Surround View LUT sub sample */
    UInt32  ldcOutFrameWidth[ALGLINK_SRV_COMMON_MAX_CAMERAS];
    /**< Expected width of output frame, after LDC correction
            for each view point */
```

```
UInt32  ldcOutFrameHeight[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Expected height of output frame, after LDC correction
        for each view point */
UInt32  ldcOutPadX[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Applications could use this to ignore / pad pixels on output.
        e.g. if output width was 1280 and pad was 10
                actual output width would be 1270 with a 1280 pitch */
UInt32  ldcOutPadY[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Applications could use this to ignore / pad lines on output.
        e.g. if output height was 800 and pad was 10
                actual output width would be 790 lines */
UInt32  ldcOutBlockWidth[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Block Width to be used by LDC */
UInt32  ldcOutBlockHeight[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Block Height to be used by LDC */

/* This is specific to synth plugin, viewPointId should also be included */
UInt32  carPosX;
/**< Expected position of the car to be rendered at, X co-ordinate, for each
        view point */
UInt32  carPosY;
/**< Expected position of the car to be rendered at, X co-ordinate, for each
        view point */
UInt32 carBoxWidth;
/**< Width of the car box */
UInt32 carBoxHeight;
/**< Height of the car box */
Int32 viewRotationAngleRad;
/**< Slope of the rotated view in clock wise direction */
UInt32  sizeOfcarImg;
/**< Size of the CAR image, expressed in bytes. This plugin will not use
        this, required here to aid applications */
UInt32  remapChannels;
/**< Flag used to remap video input channels to output channel. When set to
        TRUE, remappedCh will hold valid remap table. */
UInt32  remappedCh[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< Define remapping for all valid view points. If remap is not desired
        for an channel, set the value to channel id as show below.

        e.g. 2 valid view point and view point 0 : no remap required and
            view point 1 require channel remap. Channels 0,3 are inter
            changed & channels 1 & 2 are interchaned.

        remapChannels = FALSE;
        remappedCh[0U] = 0U;
        remappedCh[1U] = 1U;
        remappedCh[2U] = 2U;
```

```
        remappedCh[3U] = 3U;

        remapChannels = TRUE;
        remappedCh[0U] = 3U;
        remappedCh[1U] = 2U;
        remappedCh[2U] = 1U;
        remappedCh[3U] = 0U;
        */
AlgorithmLink_ldcSlicePrm slicePrm[ALGLINK_SRV_COMMON_MAX_CAMERAS];
/**< LDC Slice parameters */
UInt32 carFormat;
/**< Car dump format - Y or Y+UV */
   /**< Car dump format - Y or Y+UV */
/* Corners defined in following order:
 * 0: Front Right
 * 1: Rear Right
 * 2: Rear Left
 * 3: Front Left
 */
UInt32 carCornerX[4];
/* X coordinate of car corners */
UInt32 carCornerY[4];
/* Y coordinate of car corners */
UInt32 boxCornerX[4];
/* X coordinate of box corners */
UInt32 boxCornerY[4];
/* Y coordinate of box corners */
float   *viewToWorldMeshTable;
/**< Describes a map from real world to mesh table */
UInt32  *carImgPtr;
/**< Pointer describing the CAR. This plugin will not use this, required
        here to aid applications */
UInt32 *baseBufAddr;
/**< Base address of the super buffer, this buffer will hold all the
        required data for a given view point */
System_VideoFrameCompositeBuffer *pCompBuf;
/**< Composite buffer, Caller allocated memory required for this structures
        and will use the following members as input and output
        numFrames   [IN]  Will be used to specify the number of cameras
        metaBufAddr [IN/OUT]    The space for this array of pointer is
                                allocated by caller and this function will
                                update the same with LDC LUTs
                                metaBufAddr[0] will hold the memory required
                                for channel 0 (camera 0) and so on...
        metaBufSize [OUT]   Will specify the total size in bytes for all
                                channels */
Int8 *blendTableAddr;
```

```
    /**< Blend Table Address */
} AlgorithmLink_SrvCommonViewPointParams;
```

The V2W_IDX.BIN file has the following format:

- 4 bytes : No of view points
- 4 bytes : Uncompressed V2W Table Size
- 4 bytes : Number of sets
- 116 bytes : Header (currently empty)
- List of Offset (4 bytes) and Size (4 bytes) values of data sections into the uncompressed V2W Table for each view point.

3.6 Notations Used and Concept of Sets

The following notations are used here:

S - set size : number of view point per set

M - index of last set : number of sets the view points have been divided into

N - no. of View Points: total number of View Points.

The LUTs such as CARIMAGE, LDC and BlendTable are compressed to save space on the non-volatile storage by using the LZ4 compression technique.

The sets are created in such a way as to optimize the Surround View and ensure that the first view comes up as fast as possible.

So the sets are defined as:

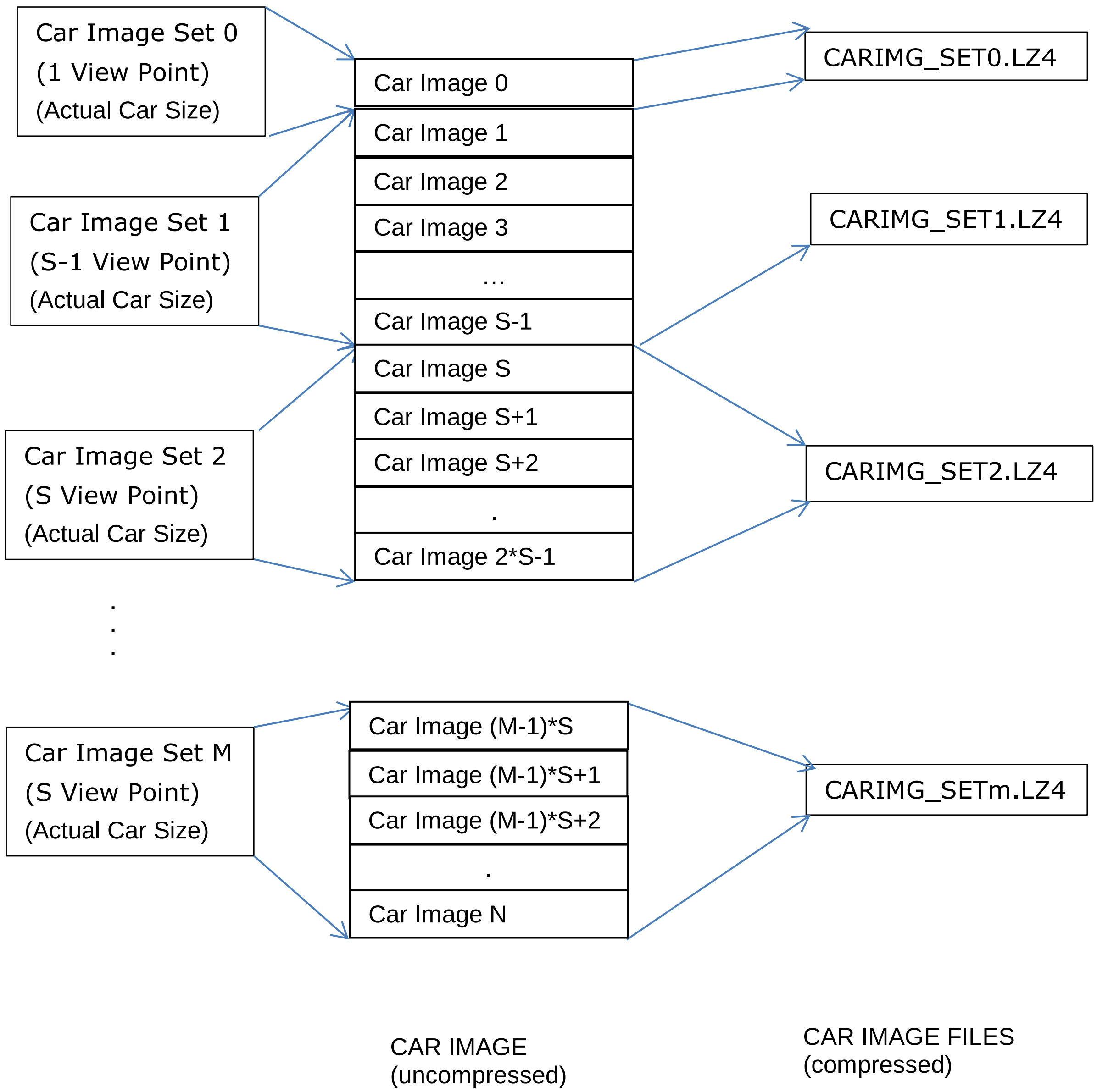
Set 0 : contains the View Point 0, decompress just 1 view point for the first view point to be displayed asap

Set 1 : contains the View Point 1 to S-1, decompress the data for the first transition to happen asap

Set 2+: and henceforth all the sets contain one transition data

3.7 Format of CARIMG_IDX.BIN and CARIMG_SETx.LZ4 files

CARIMG_SETx.LZ4 contains the compressed car image files.



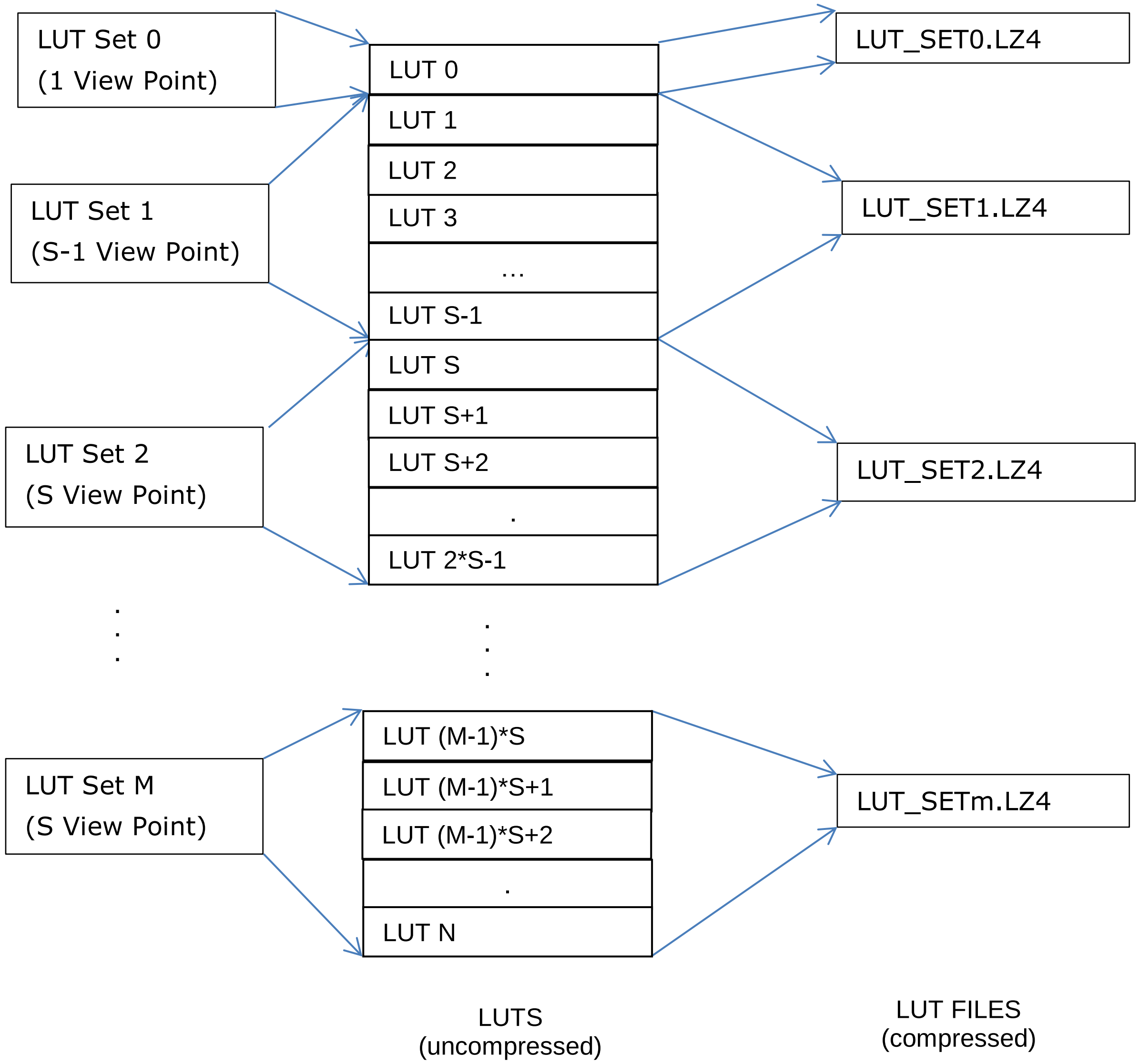
The CARIMG_IDX.BIN file has the following format:

- 4 bytes : No of view points
- 4 bytes : Total Uncompressed CARIMG Size
- 4 bytes : Number of sets
- 4*(M+1) bytes : Per set uncompressed size
- 116–4*(M+1) bytes : Header (currently empty)
- List of Offset (4 bytes) and Size (4 bytes) values of data sections into the uncompressed Car Image for each view point.

3.8 Format of LUT_SETx.LZ4 and LUT_IDX.BIN files

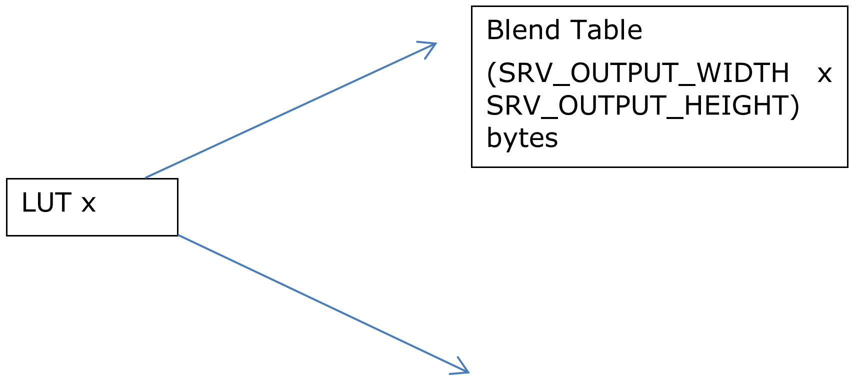
The LUT_SETx.LZ4 file contains the following data sections for every view point:

- 1024 bytes header of the view point
- 4 LDC LUTs for each camera of size 80 KB (Max)
- Blend Table of size (Surround View Width x Surround View Height) of the view point



Each View Point LUT has the following structure:

Header: 1024 bytes
4 LDC LUT for each camera: 89472 x 4 bytes (Max)



The header is of the same format as V2W.BIN file.

The LUT_IDX.BIN file has the following format:

- 4 bytes : No of view points
- 4 bytes : Total Uncompressed LUT Size
- 4 bytes : Number of sets
- 4*(M+1) bytes : Per set uncompressed size
- 116–4*(M+1) bytes : Header (currently empty)
- List of Offset (4 bytes) and Size (4 bytes) values of data sections into the uncompressed LUT for each view point.

4 3D SRV

This provides a brief overview of the sample application or use case present in the SDK and procedure to run it.

4.1 Demo Application

The 3D SRV application is implemented in `\vision_sdk\apps\src\rtos\usecases\iss_mult_capture_isp_dewarp_3dsv_tda3xx`

This demo application would read compressed LDC LUTs present in LUT_SETx.LZ4 (indexed by LUT_IDX.BIN), decompress them on the DSP, use DeWarp algorithm to correct lens distortion and project to get individual images for a given view point, use synthesis algorithm to stich individual images to get SRV. 3D SRV is achieved by switching through multiple view-points at capture frame rate.

In the case that the output resolution was changed during the generation of the V2W tables, the standalone surroundview use case will use the parsed information from the V2W table to set the output resolution. If modifying the rearview + 3D surroundview or the 2D + 3D surroundview use case, the SRV_UC_3D_SYNTH_OUTPUT_WIDTH_MAX and SRV_UC_3D_SYNTH_OUTPUT_HEIGHT_MAX values must be modified to correspond to the desired output resolution height.

Note: The output resolution for these additional use cases must not overlap with the additional views (i.e., rearview and 2D surroundview).

4.2 Execution of demo application

Follow the steps detailed in TDA3xx user guide to build, load binaries and required connectivity with EVM (only serial terminal would be required).

- Ensure mmc/sd card has folder named TDA3X and it contains valid LUT_IDX.BIN & LUT_SETx.LZ4
- Ensure mmc/sd is not hot swapped, i.e. while board is powered up and running Vision SDK binary, DO NOT remove / insert mmc/sd card.

1. Depending on the sensor used in the setup, instruct demo app to use the same
    - In Main Menu, select "s" settings
    - Choose "Capture Settings"
    - Choose either "OV10640 Sensor for SV – IMI (TDA3x ONLY)" OR "AR0140 Sensor for SV – TIDA00262 (TDA3x ONLY)"
2. Choose to run ISS based demos
    - In Main Menu select "ISS Use-cases, (TDA3x ONLY)"
3. Choose to run 3D SRV "3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display"
    - Log should indicate the status of LDC LUTs read "SRV_MEDIA: Reading LDC LUT for view point 0"
    - Once message "[IPU1-0]   140.434362 s: ISSCAPTURE: Start Done !!!" is displayed
    - 3D SRV should be visible on connected TV

5 Calibration

Position of camera has significant effect on SRV, if and when camera positions are altered, calibration application could be used to fine tune camera positions. Calibration application is implemented in `\vision_sdk\apps\src\rtos\usecases\srv_calibration`

Before attempting calibration, please ensure all the software requirements specified in section 2 is addressed and required LUTs are available in mmc/sd, refer section 3.2

There are 2 options to caliber the 3D SRV on TDA3x, Automatic mode and manual mode

5.1 Auto

Make sure the following files are already present in the MMC/SD card inside the 'TDA3X' directory:

- **CHARTPOS.BIN**
- **V2W.LZ4**
- **V2W_IDX.BIN**
- **LENS.BIN**
- **LENS_2D.BIN**

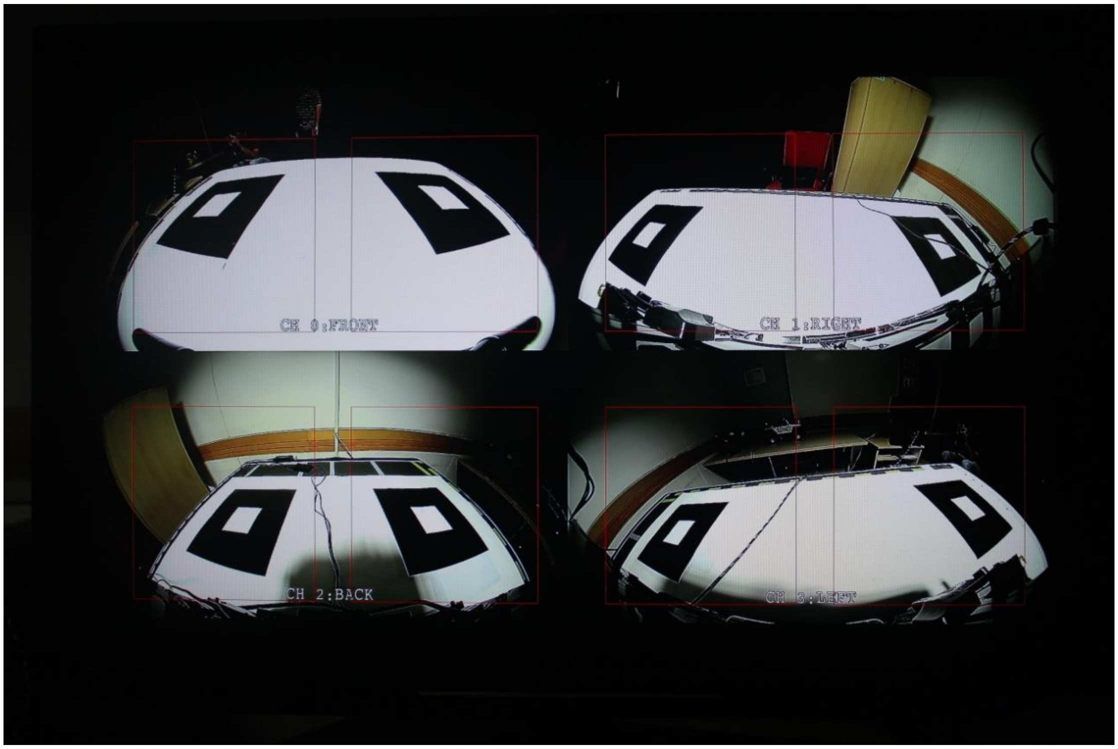
The '`\vision_sdk\apps\tools\Lens_params`' directory contains the lens parameters for the following lens modules:

1. Equisolid : LENS_equisolid_455focallength.BIN
2. Imi : LENS_imi.BIN
3. Sunex : LENS_sunex_dsl218.BIN
4. 2D : LENS_2D.BIN
5. DSL219 with IMX290 sensor: LENS_SunexDSL219_imx290.BIN
6. DSL267 with OV10640 sensor (Newer TDA3X RVP boards): LENS_SunexDSL267_ov10640.BIN

'LENS_2D.BIN' should be copied to TDA3X folder on MMC/SD card.

Based on the lens module used in the system the corresponding LENS_xxx.BIN should be renamed to 'LENS.BIN' and copied to TDA3X folder on MMC/SD card.

Once the jeep/car is placed on the calibration chart, run this usecase. When the mosaic display comes up, TWO bounding boxes in each of the four windows can be seen as shown in the following Figure:



These boxes indicate the Region of Interest (ROI) within which the TWO squares of the Calibration chart should be confined to. Now select option # 1 – "Auto Calibration", the Auto Calibration is done in 2 steps without user intervention:

1. **Calibration Matrix (CalMat) Generation:**

   Input: The YUV images from the FOUR cameras.
   The Chart Position read from CHARTPOS.BIN file.

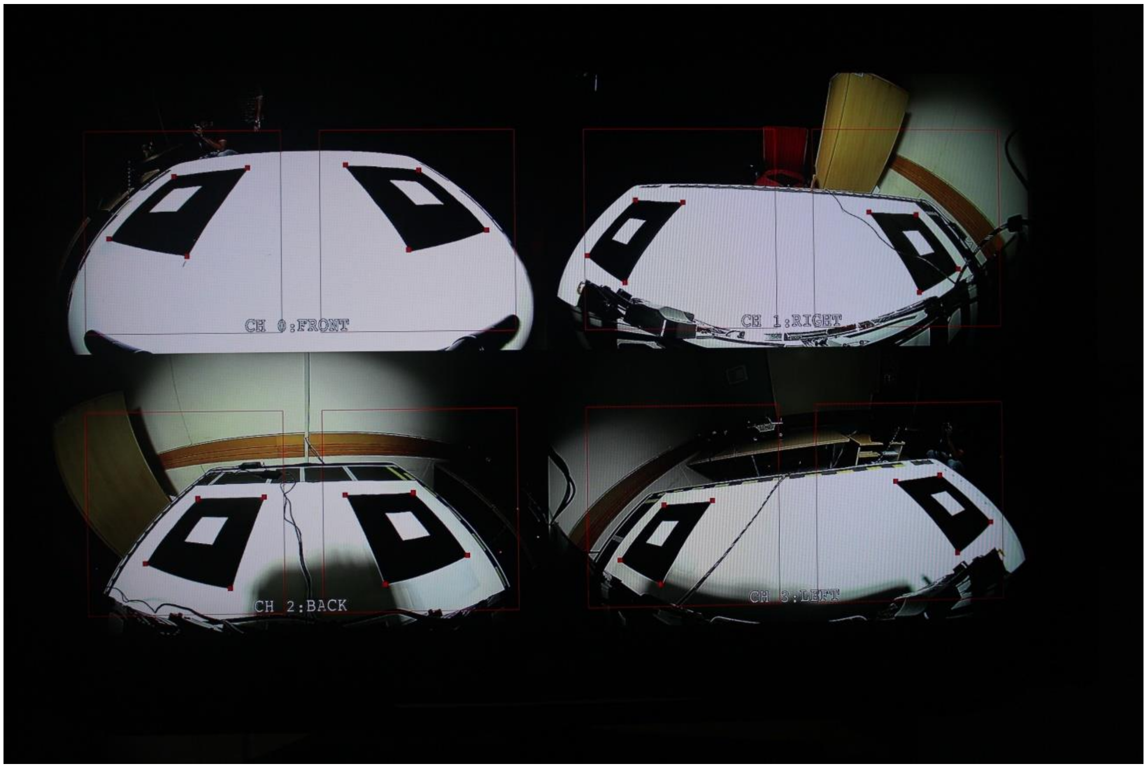
   Output: CalMat which is also dumped to CALMAT.BIN file.

2. **LDC Look Up Table (LUT) Generation**

   Input: CalMat generated in step # 1.

		View to World table for each view point read from the V2W.LZ4 file after decompression.
	Output:	LDC LUTs for each view point are compressed and written into LUT_SETx.LZ4 and LUT_IDX.BIN files.

If the step # 1 is successful then the user can see the detected corner points plotted on to the display as shown in the following Figure:



If the Step # 1 fails and if CALMAT.BIN file is present in the MMC/SD card then calibration will resume with step # 2 by reading the CALMAT.BIN file, else it will be aborted.

5.2 Manual

This is 3 step processes where in this usecase is used to dump frames into mmc/sd, PC based tool is used to generate CALMAT.BIN and this usecase is used to generate LUT_IDX.BIN & LUT_SETx.LZ4

1. Dump 1 frame from each camera into mmc/sd
2. Provide these dumped images to PC based tool and generate CALMAT.BIN
3. Generate LUT_IDX.BIN & LUT_SETx.LZ4
4. When 3SRV demo is run, these tables are read and 3D SRV is rendered

5.2.1 Steps to run Manual mode calibration

Once the “Manual Calibration” is chosen, manual mode menu is shown

2. Select option "Save ISP output frames (Will be saved in MMC/SD : All channels)"
   - This will dump FRONT_0.YUV, RIGHT_0.YUV, BACK_0.YUV & LEFT_0.YUV into mmc/sd.

3. Choose to remove mmc/sd with option "Unmount File System before removing MMC/SD card" remove the mmc/sd card after this option is used.

4. With the PC based tool and using FRONT_0.YUV, RIGHT_0.YUV, BACK_0.YUV & LEFT_0.YUV as input, generate CALMAT.BIN. Refer "manual_TI_3D_SurroundVision_CalibTool" under ../ 3d_calibration_tool for detailed instructions.

5. Copy the CALMAT.BIN to mmc/sd in TDA3X folder

6. Insert the mmc/sd and remount the mmc/sd using option "Mount File System after inserting MMC/SD card"

7. Generate LDC LUTs using option "Compute LDC LUTs for 3D SRV (All view points)"

8. Re-Run 3D SRV demo.

6 Development Guide

6.1 Compression of LUTs

There is an additional support of LZ4 compression technique provided with the usecase where the LUTs such as V2W, LDC, Blend Table can be compressed to save the storage space on the non-volatile memory such as SD Card, Flash, etc. Such compression and decompression happens on the DSP of choice.

6.1.1 Selection of DSP to run the decompression for SRV usecase

The DSP to run decompression algorithm can be selected by changing the value of the macro `SYSTEM_LINK_ID_LZ4_DSP` to `SYSTEM_LINK_ID_DSP1` or `SYSTEM_LINK_ID_DSP2` depending upon the need in the `vision_sdk/apps/src/include/chains_common_srv_calib.h` file.

6.1.2 Compression Ratio vs Decompression Time

There is a choice depending upon the requirement of compression ratio vs the time taken to decompress on the DSP. This can be tuned using the LZ4 memory usage tuning parameter in the file `vision_sdk/apps/src/rtos/modules/lz4CompDecomp/lz4.h` by tuning the value of the macro `LZ4_MEMORY_USAGE` which is briefly defined below:

LZ4_MEMORY_USAGE :

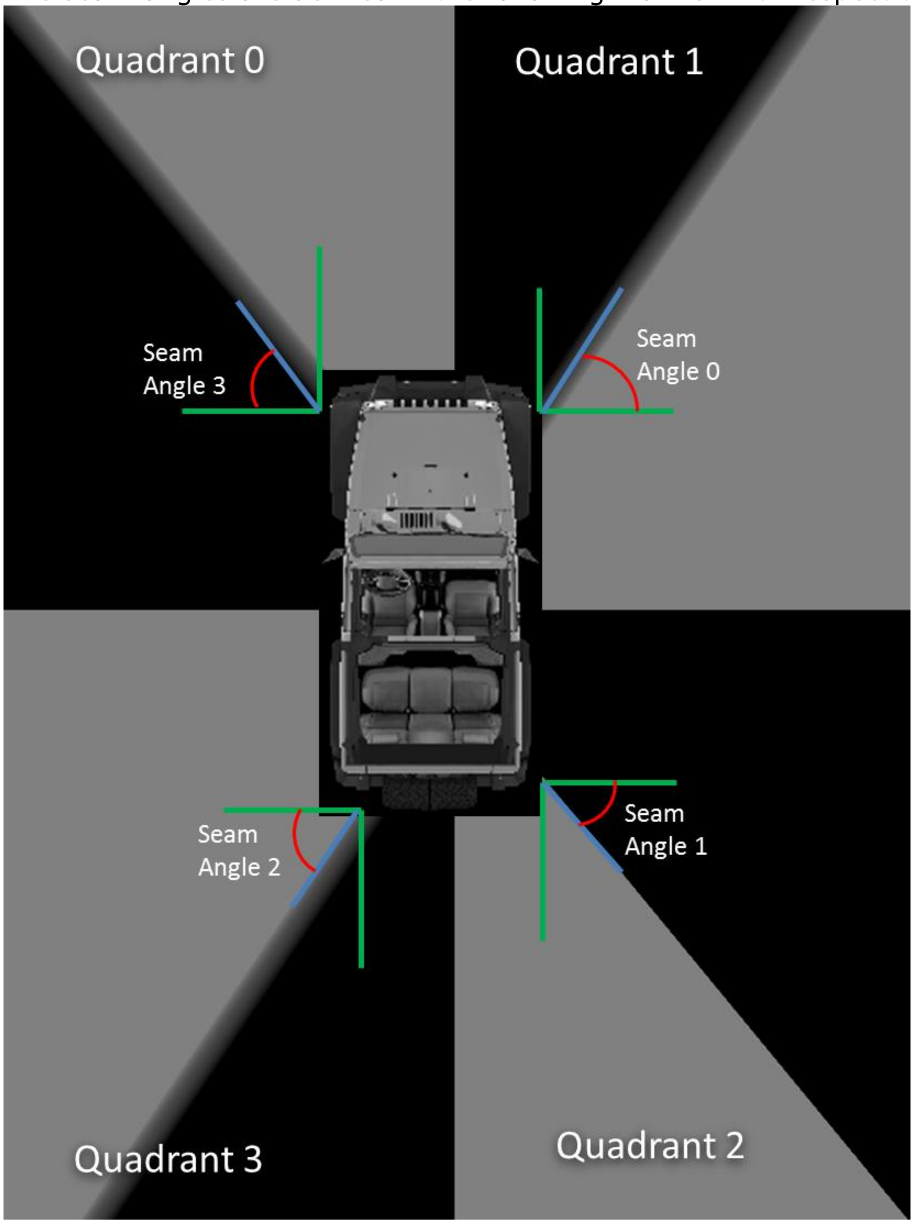
Memory usage formula : N->2^N Bytes (examples : 10 -> 1KB; 12 -> 4KB ; 16 -> 64KB; 20 -> 1MB; etc.)

Increasing memory usage improves compression ratio

Reduced memory usage can improve speed, due to cache effect
Default value is 14, for 16KB, which nicely fits into Intel x86 L1 cache

6.2 Changing the seam angle and it's limitation

The seam angles are defined in the following manner with respect to the car body



The bigger limitations on the seam angle are that all the seam angles must lie between 0° and 90°

There are also a few limitations where the output might have **some imperfections for some particular angles.** This usually does not happen at normal angles.
The seam angles can be changed from default angles in the file:

```
vision_sdk/apps/src/rtos/alg_plugins/surroundview/svBlendTableGen_If.c
```

To change the seam angles, change this:

```
#if 0
    seamAngle[0] = 45.0;
    seamAngle[1] = 45.0;
    seamAngle[2] = 45.0;
    seamAngle[3] = 45.0;
#else
    seamAngle[0] = seamAngle[1] = seamAngle[2] = seamAngle[3] =
(atanf((float)svSynthObj.SVOutDisplayHeight/(float)svSynthObj.SVOutDi
splayWidth) * 180.0f)/M_PI;
#endif
```

to

```
#if 1
    seamAngle[0] = <specify angle of choice>;
    seamAngle[1] = <specify angle of choice>;
    seamAngle[2] = <specify angle of choice>;
    seamAngle[3] = <specify angle of choice>;
#else
    seamAngle[0] = seamAngle[1] = seamAngle[2] = seamAngle[3] =
(atanf((float)svSynthObj.SVOutDisplayHeight/(float)svSynthObj.SVOutDi
splayWidth) * 180.0f)/M_PI;
#endif
```

Doing this recompile the code and recreate the AppImage and rerun the calibration usecase to generate new LUTs.

7 Sample LOGs

7.1 Select the camera used

```
[IPU1-0]  Vision SDK Usecases,
[IPU1-0]  --------------------
[IPU1-0]  1: Single Camera Usecases
[IPU1-0]  2: Multi-Camera LVDS Usecases
[IPU1-0]  3: AVB RX Usecases, (TDA2x & TDA2Ex ONLY)
[IPU1-0]  4: Dual Display Usecases, (TDA2x EVM ONLY)
[IPU1-0]  5: ISS Usecases, (TDA3x ONLY)
[IPU1-0]  6: xCAM Usecases
[IPU1-0]  a: Miscellaneous test's
[IPU1-0]
[IPU1-0]  s: System Settings
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: S
[IPU1-0]
[IPU1-0]     16.691850 s:
[IPU1-0]     16.691911 s:
[IPU1-0]
[IPU1-0]  ===============
[IPU1-0]  System Settings
[IPU1-0]  ===============
[IPU1-0]
[IPU1-0]  1: Display Settings
```

```
[IPU1-0]  2: Capture Settings
[IPU1-0]  3: ISS Settings (TDA3x ONLY)
[IPU1-0]  4: Enable Charging via USB2 Port (TDA2x EVM ONLY)
[IPU1-0]  5: Print PRCM Statistics
[IPU1-0]  6: Show Memory/CPU/DDR BW usage
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 2
[IPU1-0]
[IPU1-0]     16.692155 s:
[IPU1-0]     17.238638 s:
[IPU1-0]
[IPU1-0]  ==============
[IPU1-0]  Capture Source
[IPU1-0]  ==============
[IPU1-0]
[IPU1-0]  1: OV10635 Sensor 720P30
[IPU1-0]  2: HDMI Capture 1080P60 (Not Supported in TDA2x/TDA2Ex Multi-serdes board)
[IPU1-0]  3: OV10640 Sensor 720P30 - CSI2 (TDA3x ONLY)
[IPU1-0]  4: OV10640 Sensor 720P30 - Parallel (TDA3x ONLY)
[IPU1-0]  5: AR0132  Sensor 720P60 - Parallel (TDA3x ONLY)
[IPU1-0]  6: AR0140  Sensor 720P60 - Parallel (TDA3x ONLY)
[IPU1-0]  7: IMX224  Sensor 1280x960 - CSI2 (TDA3x ONLY)
[IPU1-0]  8: AR0132  Sensor 720P60 DM388 - Parallel (TDA2x MonsterCam ONLY)
[IPU1-0]  9: AR0140  Sensor for SV - TIDA00262 (TDA3x ONLY)
[IPU1-0]  a: OV10640 Sensor for SV - IMI (TDA3x ONLY)
[IPU1-0]  b: OV10635 Sensor for Mosaic Display - SAT0088/OV10635 (TDA2EX & TDA3x)
[IPU1-0]  c: Skip Sensor configuration
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 9 or a depending on the camera used
[IPU1-0]
[IPU1-0]     17.239095 s:
[IPU1-0]     17.962941 s:
[IPU1-0]      8.182760 s:  Current System Settings,
[IPU1-0]      8.182821 s:  ========================
[IPU1-0]      8.182882 s:  Display Type    : HDMI 1920x1080 @ 60fps
[IPU1-0]      8.182943 s:  Capture Source : Sensor OV10640 IMI 1280x720 @ 30fps - ISS CSI2, Bayer
(TDA3x EVM ONLY)
[IPU1-0]      8.183035 s:  My IP address   : none
[IPU1-0]      8.183096 s:  ISS Settings    : LDC=[OFF] VTNF=[OFF] WDR=[OFF]
[IPU1-0]      8.183157 s:
[IPU1-0]      8.183187 s:  ============
[IPU1-0]      8.183248 s:  Usecase Menu
[IPU1-0]      8.183279 s:  ============
[IPU1-0]     17.963673 s:
[IPU1-0]
[IPU1-0]  Vision SDK Usecases,
[IPU1-0]  --------------------
[IPU1-0]  1: Single Camera Usecases
[IPU1-0]  2: Multi-Camera LVDS Usecases
[IPU1-0]  3: AVB RX Usecases, (TDA2x & TDA2Ex ONLY)
```

```
[IPU1-0]  4: Dual Display Usecases, (TDA2x EVM ONLY)
[IPU1-0]  5: ISS Usecases, (TDA3x ONLY)
[IPU1-0]  6: xCAM Usecases
[IPU1-0]  a: Miscellaneous test's
[IPU1-0]
[IPU1-0]  s: System Settings
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
```

7.2 Calibration Use case selection

```
[IPU1-0]  Vision SDK Usecases,
[IPU1-0]  --------------------
[IPU1-0]  1: Single Camera Usecases
[IPU1-0]  2: Multi-Camera LVDS Usecases
[IPU1-0]  3: AVB RX Usecases, (TDA2x & TDA2Ex ONLY)
[IPU1-0]  4: Dual Display Usecases, (TDA2x EVM ONLY)
[IPU1-0]  5: ISS Usecases, (TDA3x ONLY)
[IPU1-0]  6: xCAM Usecases
[IPU1-0]  a: Miscellaneous test's
[IPU1-0]
[IPU1-0]  s: System Settings
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 5
[IPU1-0]
[IPU1-0]     19.977185 s:
[IPU1-0]     19.977307 s:
[IPU1-0]
[IPU1-0]  ISS Usecases (TDA3x ONLY)
[IPU1-0]  ---------------------------
[IPU1-0]  1: 1CH ISS capture + ISS ISP + ISS LDC+VTNF + Display
[IPU1-0]  2: 4CH ISS capture + ISS ISP + Simcop + Surround View (DSP1) +  Display
[IPU1-0]  3: 1CH ISS capture (AR0132) + ISS ISP Monochrome +  Display
[IPU1-0]  4: 3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display
[IPU1-0]  5: Surround View Calibration
[IPU1-0]  6: 3D + 2D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display
[IPU1-0]  7: 3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + RearView + Display
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 5
[IPU1-0]
[IPU1-0]     20.593607 s:
[IPU1-0]      9.288324 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x40
[IPU1-0]      9.289544 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x42
[IPU1-0]      9.290733 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x44
[IPU1-0]      9.291923 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x46
[IPU1-0]      9.332824 s:  ISSCAPTURE: Create in progress !!!
[IPU1-0]      9.640730 s:  UTILS: DMA: Allocated CH (TCC) = 48 (48)
```

```
[IPU1-0]      9.640852 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 48 (0x63304800)
[IPU1-0]      9.641066 s:  ISSCAPTURE: Create Done !!!
[IPU1-0]      9.641279 s:  ISSM2MISP: Create in progress !!!
[IPU1-0]      9.974043 s:  UTILS: DMA: Allocated CH (TCC) = 49 (49)
[IPU1-0]      9.974135 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 49 (0x63304820)
[IPU1-0]      9.986915 s:  ISSM2MISP: Create Done !!!
[IPU1-0]      9.987159 s:  ALGORITHM: Create in progress (algId = 3) !!!
[IPU1-0]     10.044653 s:  ALGORITHM: Create Done (algId = 3) !!!
[IPU1-0]     10.045598 s:  VPE: Create in progress !!!
[IPU1-0]     10.209632 s:  VPE: Create Done !!!
[IPU1-0]     10.210028 s:  ALGORITHM: Create in progress (algId = 0) !!!
[IPU1-0]     10.428201 s:  UTILS: DMA: Allocated CH (TCC) = 50 (50)
[IPU1-0]     10.428323 s:  UTILS: DMA: 0 of 8: Allocated PaRAM = 50 (0x63304840)
[IPU1-0]     10.428506 s:  UTILS: DMA: 1 of 8: Allocated PaRAM = 67 (0x63304860)
[IPU1-0]     10.428628 s:  UTILS: DMA: 2 of 8: Allocated PaRAM = 68 (0x63304880)
[IPU1-0]     10.428719 s:  UTILS: DMA: 3 of 8: Allocated PaRAM = 69 (0x633048A0)
[IPU1-0]     10.428841 s:  UTILS: DMA: 4 of 8: Allocated PaRAM = 70 (0x633048C0)
[IPU1-0]     10.428963 s:  UTILS: DMA: 5 of 8: Allocated PaRAM = 71 (0x633048E0)
[IPU1-0]     10.429085 s:  UTILS: DMA: 6 of 8: Allocated PaRAM = 72 (0x63304900)
[IPU1-0]     10.429207 s:  UTILS: DMA: 7 of 8: Allocated PaRAM = 73 (0x63304920)
[IPU1-0]     10.429451 s:  ALGORITHM: Create Done (algId = 0) !!!
[IPU1-0]     10.429573 s:  DISPLAY: Create in progress !!!
[IPU1-0]     10.430061 s:  DISPLAY: Create Done !!!
[IPU1-0]     10.430336 s:  GRPXSRC: Create in progress !!!
[IPU1-0]     11.827609 s:  GRPXSRC: Create Done !!!
[IPU1-0]     11.827914 s:  DISPLAY: Create in progress !!!
[IPU1-0]     11.828341 s:  DISPLAY: Create Done !!!
[IPU1-0]     12.328066 s:  UTILS: DMA: Allocated CH (TCC) = 51 (51)
[IPU1-0]     12.328188 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 51 (0x63304940)
[IPU1-0]     12.328676 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1022
[IPU1-0]     12.328798 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 156416 B (152 KB)
[IPU1-0]     12.328951 s:  SYSTEM: Heap = SR_OCMC              @ 0x00000000, Total size = 0 B (0
KB), Free size = 0 B (0 KB)
[IPU1-0]     12.329103 s:  SYSTEM: Heap = SR_DDR_CACHED        @ 0x85483000, Total size = 367001600
B (350 MB), Free size = 244143104 B (232 MB)
[IPU1-0]     12.329256 s:  SYSTEM: Heap = SR_DDR_NON_CACHED    @ 0xbfe00000, Total size = 1048832 B
(1 MB), Free size = 1041152 B (0 MB)
[IPU1-0]     12.333099 s:  *** UTILS: CPU KHz = 20000 Khz ***
[IPU1-1]     12.329957 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[IPU1-1]     12.330110 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 255424 B (249 KB)
[DSP1  ]     12.330506 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[DSP1  ]     12.330567 s:  SYSTEM: Heap = LOCAL_L2             @ 0x00800000, Total size = 227264 B
(221 KB), Free size = 227264 B (221 KB)
[DSP1  ]     12.330628 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 524288 B
(512 KB), Free size = 519504 B (507 KB)
[DSP2  ]     12.330872 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[DSP2  ]     12.330933 s:  SYSTEM: Heap = LOCAL_L2             @ 0x00800000, Total size = 227264 B
(221 KB), Free size = 227264 B (221 KB)
[DSP2  ]     12.330994 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 524288 B
(512 KB), Free size = 519504 B (507 KB)
[EVE1  ]     12.331665 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[EVE1  ]     12.331940 s:  SYSTEM: Heap = LOCAL_L2             @ 0x40020000, Total size = 24576 B
(24 KB), Free size = 24576 B (24 KB)
[EVE1  ]     12.332489 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 257448 B (251 KB)
[IPU1-0]     12.873879 s:  ISS_SENSOR: VIP 42: DRV ID 120f (I2C ADDR 0x40): a640:00b4:0000
```

```
[IPU1-0]     12.875800 s:  ISS_SENSOR: VIP 43: DRV ID 120f (I2C ADDR 0x42): a640:00b4:0000
[IPU1-0]     12.877722 s:  ISS_SENSOR: VIP 44: DRV ID 120f (I2C ADDR 0x44): a640:00b4:0000
[IPU1-0]     12.879704 s:  ISS_SENSOR: VIP 45: DRV ID 120f (I2C ADDR 0x46): a640:00b4:0000
[IPU1-0]     12.879826 s:  Sensor Config time = 547 msec
[IPU1-0]     12.879979 s:  QSPI Read Started, please wait!
[IPU1-0]     12.880131 s:  QSPI Read Completed Sucessfully
[IPU1-0]     12.880192 s:  CHAINS: DCC Tag ID check failed for QSPI
[IPU1-0]     12.880253 s:  CHAINS: Using DCC Profile from Driver
[IPU1-0]     12.902214 s:  HDMI_TX: hdmiId.deviceId = 176,hdmiId.deviceProdRevId = 2, hdmiId.hdcpRevTpi = 0, hdmiId.tpiRevId = 3
[IPU1-0]     12.902641 s:  HDMI_TX: hpdPrms.busError = 2, hpdPrms.hpdEvtPending = 0, hpdPrms.hpdStatus = 4
[IPU1-0]     12.911181 s:  DISPLAY: Start in progress !!!
[IPU1-0]     12.911273 s:  DISPLAY: Start Done !!!
[IPU1-0]     12.916702 s:  DISPLAY: Start in progress !!!
[IPU1-0]     12.916763 s:  DISPLAY: Start Done !!!
[IPU1-0]     12.917037 s:  ISSCAPTURE: Start in progress !!!
[IPU1-0]     12.917281 s:  ISSCAPTURE: Start Done !!!
[IPU1-0]     25.251021 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Chains Run-time Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Stop Chain
[IPU1-0]  1: Auto Calibration
[IPU1-0]  2: Manual Calibration
[IPU1-0]
[IPU1-0]
[IPU1-0]  p: Print Performance Statistics
[IPU1-0]
[IPU1-0]  Enter Choice:
[IPU1-0]
```

7.3 Auto Calibration Selection

```
[IPU1-0]  ====================
[IPU1-0]  Chains Run-time Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Stop Chain
[IPU1-0]
[IPU1-0]  1: Auto Calibration
[IPU1-0]  2: Manual Calibration
[IPU1-0]  3: Default Calibration (Using Default Cal Mat)
[IPU1-0]
[IPU1-0]  4: Save Capture Frames for all channels to MMC/SD card
[IPU1-0]  5: Unmount File System before removing MMC/SD card
[IPU1-0]  6: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  7: Update 2D Pers Mat (after auto/manual calibration if required)
[IPU1-0]
[IPU1-0]  d: Save Display Frame to MMC/SD card
[IPU1-0]
[IPU1-0]
[IPU1-0]  p: Print Performance Statistics
```

```
[IPU1-0]
[IPU1-0]  Enter Choice: 1
[IPU1-0]
[IPU1-0]     23.119532 s: SRV_CALIB_UC: 1.Generating the calibration Matrix …
[IPU1-0]     23.119624 s: SRV_CALIB_UC: => Dumping YUV frames …
[IPU1-0]     23.395351 s: SRV_CALIB_UC: => Reading file CHARTPOS.BIN …
[IPU1-0]     23.409168 s: SRV_CALIB_UC: => Cal Mat Generation on DSP …
[IPU1-0]     23.409534 s:  gLensPrm = 0x8C9ADC00
[IPU1-0]     23.438205 s:  Lens parameters read
[IPU1-0]     23.438479 s:  gLensPrm2D = 0x8C9AFE00
[IPU1-0]     23.444671 s:  Lens parameters read for 2D
[DSP1  ]     23.444915 s: CAL_MAT: Generating Calibration Matrix …
[DSP1  ]     23.444946 s:  Auto Detect Chart Persistemt Mem Size = 6472288
[DSP1  ]     23.444976 s:  Auto Detect Chart Scratch Mem Size    = 6984
[DSP1  ]     38.228359 s: Corners detected for camera 0
[DSP1  ]     38.228390 s: Chart number 0
[DSP1  ]     38.228420 s: [265 769; 278 959; 428 1140; 474 935]
[DSP1  ]     38.228451 s: Chart number 1
[DSP1  ]     38.228481 s: [288 340; 271 527; 497 368; 440 164]
[DSP1  ]     54.850179 s: Corners detected for camera 1
[DSP1  ]     54.850240 s: Chart number 0
[DSP1  ]     54.850240 s: [331 250; 335 377; 543 223; 474 126]
[DSP1  ]     54.850271 s: Chart number 1
[DSP1  ]     54.850301 s: [364 865; 373 991; 522 1102; 580 995]
[DSP1  ]     75.578234 s: Corners detected for camera 2
[DSP1  ]     75.578265 s: Chart number 0
[DSP1  ]     75.578295 s: [352 758; 353 933; 518 1066; 582 851]
[DSP1  ]     75.578326 s: Chart number 1
[DSP1  ]     75.578356 s: [356 384; 355 551; 584 466; 522 251]
[DSP1  ]     90.290276 s: Corners detected for camera 3
[DSP1  ]     90.290337 s: Chart number 0
[DSP1  ]     90.290337 s: [378 309; 362 429; 575 317; 529 207]
[DSP1  ]     90.290367 s: Chart number 1
[DSP1  ]     90.290398 s: [306 916; 298 1043; 437 1171; 506 1078]
[DSP1  ]     90.290459 s:  Pose Estimate Chart Persistemt Mem Size = 4896
[DSP1  ]     90.290489 s:  Pose Estimate Chart Scratch Mem Size    = 18504
[DSP1  ]     90.290520 s:  Chart Size  = 247
[DSP1  ]     90.290520 s:  Chart Pos 1 = 0,0
[DSP1  ]     90.290550 s:  Chart Pos 2 = 0,828
[DSP1  ]     90.290581 s:  Chart Pos 3 = 495,828
[DSP1  ]     90.290611 s:  Chart Pos 4 = 495,0
[DSP1  ]     90.290642 s: 0) normCP.x:-1.177745, normCP.y:-0.283072
[DSP1  ]
[DSP1  ]     90.290703 s: 1) normCP.x:-0.375296, normCP.y:-0.294950
[DSP1  ]
[DSP1  ]     90.290733 s: 2) normCP.x:-1.059602, normCP.y:0.536881
[DSP1  ]
[DSP1  ]     90.290764 s: 3) normCP.x:-3.160389, normCP.y:0.534063
[DSP1  ]
[DSP1  ]     90.290794 s: 4) normCP.x:0.436740, normCP.y:-0.316311
[DSP1  ]
[DSP1  ]     90.290825 s: 5) normCP.x:1.300612, normCP.y:-0.330759
[DSP1  ]
[DSP1  ]     90.290855 s: 6) normCP.x:3.813203, normCP.y:0.524203
```

```
[DSP1  ]
[DSP1  ]     90.290886 s: 7) normCP.x:1.180084, normCP.y:0.457217
[DSP1  ]
[DSP1  ]     90.292868 s: 0) normCP.x:-1.816426, normCP.y:-0.132183
[DSP1  ]
[DSP1  ]     90.292929 s: 1) normCP.x:-0.968192, normCP.y:-0.091099
[DSP1  ]
[DSP1  ]     90.292960 s: 2) normCP.x:-2.421653, normCP.y:1.064060
[DSP1  ]
[DSP1  ]     90.292990 s: 3) normCP.x:-4.617182, normCP.y:1.027226
[DSP1  ]
[DSP1  ]     90.293021 s: 4) normCP.x:0.796116, normCP.y:0.017465
[DSP1  ]
[DSP1  ]     90.293051 s: 5) normCP.x:1.500645, normCP.y:0.058384
[DSP1  ]
[DSP1  ]     90.293082 s: 6) normCP.x:3.200070, normCP.y:1.121322
[DSP1  ]
[DSP1  ]     90.293112 s: 7) normCP.x:1.799239, normCP.y:1.115382
[DSP1  ]
[DSP1  ]     90.295095 s: 0) normCP.x:-0.931655, normCP.y:-0.011643
[DSP1  ]
[DSP1  ]     90.295125 s: 1) normCP.x:-0.289242, normCP.y:-0.015673
[DSP1  ]
[DSP1  ]     90.295156 s: 2) normCP.x:-0.655878, normCP.y:0.848784
[DSP1  ]
[DSP1  ]     90.295186 s: 3) normCP.x:-1.983040, normCP.y:0.828795
[DSP1  ]
[DSP1  ]     90.295217 s: 4) normCP.x:0.391598, normCP.y:-0.023253
[DSP1  ]
[DSP1  ]     90.295247 s: 5) normCP.x:1.126470, normCP.y:-0.025934
[DSP1  ]
[DSP1  ]     90.295278 s: 6) normCP.x:2.473815, normCP.y:0.922329
[DSP1  ]
[DSP1  ]     90.295308 s: 7) normCP.x:0.829003, normCP.y:0.872402
[DSP1  ]
[DSP1  ]     90.297261 s: 0) normCP.x:-1.352079, normCP.y:0.073638
[DSP1  ]
[DSP1  ]     90.297352 s: 1) normCP.x:-0.736425, normCP.y:0.008292
[DSP1  ]
[DSP1  ]     90.297383 s: 2) normCP.x:-1.499998, normCP.y:1.002806
[DSP1  ]
[DSP1  ]     90.297413 s: 3) normCP.x:-2.614180, normCP.y:1.025932
[DSP1  ]
[DSP1  ]     90.297444 s: 4) normCP.x:1.045540, normCP.y:-0.203628
[DSP1  ]
[DSP1  ]     90.297474 s: 5) normCP.x:1.978413, normCP.y:-0.303097
[DSP1  ]
[DSP1  ]     90.297505 s: 6) normCP.x:5.266674, normCP.y:0.768057
[DSP1  ]
[DSP1  ]     90.297535 s: 7) normCP.x:2.623557, normCP.y:0.879011
[DSP1  ]
[DSP1  ]     90.299548 s: CAL_MAT: Generating Calibration Matrix …
[DSP1  ]     90.299609 s:  Chart Size  = 247
[DSP1  ]     90.299609 s:  Chart Pos 1 = 0,0
```

```
[DSP1  ]      90.299640 s:  Chart Pos 2 = 0,828
[DSP1  ]      90.299670 s:  Chart Pos 3 = 495,828
[DSP1  ]      90.299701 s:  Chart Pos 4 = 495,0
[DSP1  ]      90.299731 s: 0) normCP.x:-0.803761, normCP.y:-0.193184
[DSP1  ]
[DSP1  ]      90.299762 s: 1) normCP.x:-0.257341, normCP.y:-0.202247
[DSP1  ]
[DSP1  ]      90.299792 s: 2) normCP.x:-0.723446, normCP.y:0.366557
[DSP1  ]
[DSP1  ]      90.299823 s: 3) normCP.x:-2.028604, normCP.y:0.342806
[DSP1  ]
[DSP1  ]      90.299853 s: 4) normCP.x:0.299579, normCP.y:-0.216971
[DSP1  ]
[DSP1  ]      90.299884 s: 5) normCP.x:0.885274, normCP.y:-0.225134
[DSP1  ]
[DSP1  ]      90.299914 s: 6) normCP.x:2.386390, normCP.y:0.328058
[DSP1  ]
[DSP1  ]      90.299945 s: 7) normCP.x:0.804513, normCP.y:0.311704
[DSP1  ]
[DSP1  ]      90.301927 s: 0) normCP.x:-1.221433, normCP.y:-0.088885
[DSP1  ]
[DSP1  ]      90.301958 s: 1) normCP.x:-0.663175, normCP.y:-0.062400
[DSP1  ]
[DSP1  ]      90.301988 s: 2) normCP.x:-1.586373, normCP.y:0.697043
[DSP1  ]
[DSP1  ]      90.302019 s: 3) normCP.x:-2.784438, normCP.y:0.619479
[DSP1  ]
[DSP1  ]      90.302049 s: 4) normCP.x:0.546110, normCP.y:0.011981
[DSP1  ]
[DSP1  ]      90.302080 s: 5) normCP.x:1.017671, normCP.y:0.039593
[DSP1  ]
[DSP1  ]      90.302110 s: 6) normCP.x:2.039511, normCP.y:0.714656
[DSP1  ]
[DSP1  ]      90.302141 s: 7) normCP.x:1.199295, normCP.y:0.743466
[DSP1  ]
[DSP1  ]      90.304123 s: 0) normCP.x:-0.638431, normCP.y:-0.007978
[DSP1  ]
[DSP1  ]      90.304184 s: 1) normCP.x:-0.198042, normCP.y:-0.010731
[DSP1  ]
[DSP1  ]      90.304215 s: 2) normCP.x:-0.448656, normCP.y:0.580613
[DSP1  ]
[DSP1  ]      90.304245 s: 3) normCP.x:-1.320480, normCP.y:0.551884
[DSP1  ]
[DSP1  ]      90.304276 s: 4) normCP.x:0.268351, normCP.y:-0.015935
[DSP1  ]
[DSP1  ]      90.304306 s: 5) normCP.x:0.769912, normCP.y:-0.017726
[DSP1  ]
[DSP1  ]      90.304337 s: 6) normCP.x:1.620820, normCP.y:0.604301
[DSP1  ]
[DSP1  ]      90.304367 s: 7) normCP.x:0.565842, normCP.y:0.595464
[DSP1  ]
[DSP1  ]      90.306289 s: 0) normCP.x:-0.920063, normCP.y:0.050109
[DSP1  ]
[DSP1  ]      90.306350 s: 1) normCP.x:-0.505275, normCP.y:0.005689
```

```
[DSP1  ]
[DSP1  ]     90.306380 s: 2) normCP.x:-1.009136, normCP.y:0.674646
[DSP1  ]
[DSP1  ]     90.306411 s: 3) normCP.x:-1.702692, normCP.y:0.668220
[DSP1  ]
[DSP1  ]     90.306441 s: 4) normCP.x:0.715284, normCP.y:-0.139308
[DSP1  ]
[DSP1  ]     90.306472 s: 5) normCP.x:1.323375, normCP.y:-0.202744
[DSP1  ]
[DSP1  ]     90.306502 s: 6) normCP.x:3.094995, normCP.y:0.451354
[DSP1  ]
[DSP1  ]     90.306533 s: 7) normCP.x:1.711315, normCP.y:0.573369
[DSP1  ]
[DSP1  ]     90.312602 s: CAL_MAT: Generating Perspective Matrix …
[IPU1-0]     90.312755 s: SRV_CALIB_UC: Writing Cal Mat to the file …
[IPU1-0]     90.414536 s: SRV_CALIB_UC: Writing Cal Mat to the file DONE
[IPU1-0]     90.414658 s: SRV_CALIB_UC: Writing Pers Mat to the file …
[IPU1-0]     90.427926 s: SRV_CALIB_UC: Writing Pers Mat to the file DONE
[IPU1-0]     90.430336 s: SRV_CALIB_UC: 2.Generating the LDC LUTs …
[IPU1-0]     91.634722 s: SRV_CALIB_UC: Reading V2W Mesh for view point 0 …
[IPU1-0]     91.721008 s: SRV_CALIB_UC: Generating LDC LUT for view point 0 …
[DSP1  ]     91.727078 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     91.873970 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     91.874367 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     91.874428 s: CarBoxCenter_x = 376, CarBoxCenter_y = 509
[DSP1  ]     91.874428 s: rotAngle = 0.000,rotAngleMod = 0.000,rotAngleRem = 0
[DSP1  ]     91.874489 s: seamAngle = 53.276
[DSP1  ]     91.874519 s: slopeAngle[0] = 53.276, slopeAngle[1] = 53.276
[DSP1  ]     91.874550 s: slopeAngle[2] = 53.276, slopeAngle[3] = 53.276
[DSP1  ]     91.874580 s: slope[0]      = 1.340, slope[1]      = 1.340
[DSP1  ]     91.874611 s: slope[2]      = 1.340, slope[3]      = 1.340
[DSP1  ]     91.874641 s: chMap[0]      = 0, chMap[1]        = 1
[DSP1  ]     91.874641 s: chMap[2]      = 2, chMap[3]        = 3
[DSP1  ]     91.874672 s: sv->seamMarkPts[0] = 6, sv->seamMarkPts[1] = 751
[DSP1  ]     91.874733 s: sv->seamMarkPts[2] = 1007, sv->seamMarkPts[3] = 747
[DSP1  ]     91.874763 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 5
[DSP1  ]     91.874794 s: sv->seamMarkPts[6] = 5, sv->seamMarkPts[7] = 0
[DSP1  ]     91.885194 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 752,H = 528
[DSP1  ]     91.885255 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 288,Y = 272,W = 176,H = 32
[DSP1  ]     91.885286 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 368,Y = 0,W = 384,H = 1008
[DSP1  ]     91.885316 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 0,Y = 496,W = 752,H = 512
[DSP1  ]     91.885377 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 384,H = 1008
[IPU1-0]     92.801195 s: SRV_CALIB_UC: Writing LDC LUT for view point 0 …
[DSP1  ]     92.800951 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]     94.823034 s: SRV_CALIB_UC: Reading V2W Mesh for view point 1 …
[IPU1-0]     94.912981 s: SRV_CALIB_UC: Generating LDC LUT for view point 1 …
[DSP1  ]     94.919203 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     95.066064 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     95.066461 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     95.066491 s: CarBoxCenter_x = 375, CarBoxCenter_y = 507
[DSP1  ]     95.066522 s: rotAngle = 6.002,rotAngleMod = 6.002,rotAngleRem = 0
[DSP1  ]     95.066552 s: seamAngle = 53.276
[DSP1  ]     95.066583 s: slopeAngle[0] = 59.278, slopeAngle[1] = 47.274
[DSP1  ]     95.066613 s: slopeAngle[2] = 59.278, slopeAngle[3] = 47.274
```

```
[DSP1  ]     95.066644 s: slope[0]      = 1.683, slope[1]      = 1.083
[DSP1  ]     95.066674 s: slope[2]      = 1.683, slope[3]      = 1.083
[DSP1  ]     95.066705 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]     95.066735 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]     95.066766 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 676
[DSP1  ]     95.066796 s: sv->seamMarkPts[2] = 914, sv->seamMarkPts[3] = 751
[DSP1  ]     95.066857 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 78
[DSP1  ]     95.066888 s: sv->seamMarkPts[6] = 100, sv->seamMarkPts[7] = 0
[DSP1  ]     95.076587 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 688,H = 528
[DSP1  ]     95.076648 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 256,Y = 272,W = 176,H = 48
[DSP1  ]     95.076709 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 928
[DSP1  ]     95.076740 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 64,Y = 496,W = 688,H = 512
[DSP1  ]     95.076770 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 80,W = 384,H = 928
[IPU1-0]     95.991703 s: SRV_CALIB_UC: Writing LDC LUT for view point 1 …
[DSP1  ]     95.991490 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]     97.839108 s: SRV_CALIB_UC: Reading V2W Mesh for view point 2 …
[IPU1-0]     97.932928 s: SRV_CALIB_UC: Generating LDC LUT for view point 2 …
[DSP1  ]     97.939150 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     98.085951 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     98.086347 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     98.086378 s: CarBoxCenter_x = 374, CarBoxCenter_y = 506
[DSP1  ]     98.086408 s: rotAngle = 12.005,rotAngleMod = 12.005,rotAngleRem = 0
[DSP1  ]     98.086469 s: seamAngle = 53.276
[DSP1  ]     98.086469 s: slopeAngle[0] = 65.280, slopeAngle[1] = 41.271
[DSP1  ]     98.086500 s: slopeAngle[2] = 65.280, slopeAngle[3] = 41.271
[DSP1  ]     98.086530 s: slope[0]      = 2.172, slope[1]      = 0.878
[DSP1  ]     98.086561 s: slope[2]      = 2.172, slope[3]      = 0.878
[DSP1  ]     98.086591 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]     98.086622 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]     98.086652 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 606
[DSP1  ]     98.086683 s: sv->seamMarkPts[2] = 836, sv->seamMarkPts[3] = 751
[DSP1  ]     98.086713 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 144
[DSP1  ]     98.086744 s: sv->seamMarkPts[6] = 177, sv->seamMarkPts[7] = 0
[DSP1  ]     98.095650 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 624,H = 528
[DSP1  ]     98.095711 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 240,Y = 272,W = 128,H = 64
[DSP1  ]     98.095742 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 848
[DSP1  ]     98.095772 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 128,Y = 496,W = 624,H = 512
[DSP1  ]     98.095833 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 160,W = 384,H = 848
[IPU1-0]     99.009424 s: SRV_CALIB_UC: Writing LDC LUT for view point 2 …
[DSP1  ]     99.009241 s: BLEND_TABLE: Generating Blend Table DONE
:
:
[IPU1-0]    300.481302 s: SRV_CALIB_UC: Reading V2W Mesh for view point 89 …
[IPU1-0]    300.575062 s: SRV_CALIB_UC: Generating LDC LUT for view point 89 …
[DSP1  ]    300.581010 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]    300.727871 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]    300.728268 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]    300.728298 s: CarBoxCenter_x = 375, CarBoxCenter_y = 508
[DSP1  ]    300.728329 s: rotAngle = 6.002,rotAngleMod = 6.002,rotAngleRem = 0
[DSP1  ]    300.728390 s: seamAngle = 53.276
[DSP1  ]    300.728420 s: slopeAngle[0] = 59.278, slopeAngle[1] = 47.274
[DSP1  ]    300.728451 s: slopeAngle[2] = 59.278, slopeAngle[3] = 47.274
[DSP1  ]    300.728481 s: slope[0]      = 1.683, slope[1]      = 1.083
[DSP1  ]    300.728512 s: slope[2]      = 1.683, slope[3]      = 1.083
```

```
[DSP1  ]    300.728542 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]    300.728573 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]    300.728603 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 676
[DSP1  ]    300.728634 s: sv->seamMarkPts[2] = 915, sv->seamMarkPts[3] = 751
[DSP1  ]    300.728664 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 79
[DSP1  ]    300.728695 s: sv->seamMarkPts[6] = 101, sv->seamMarkPts[7] = 0
[DSP1  ]    300.738455 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 688,H = 528
[DSP1  ]    300.738485 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 256,Y = 272,W = 176,H = 48
[DSP1  ]    300.738546 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 928
[DSP1  ]    300.738577 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 64,Y = 496,W = 688,H = 512
[DSP1  ]    300.738638 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 80,W = 384,H = 928
[IPU1-0]    301.653510 s: SRV_CALIB_UC: Writing LDC LUT for view point 89 …
[DSP1  ]    301.653297 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]    302.716189 s: SRV_CALIB_UC: Time taken to write 90 view point data = 211075 msec
[IPU1-0]    302.736472 s: SRV_CALIB_UC: => Dumping YUV frames …
[DSP1  ]    302.898523 s:  2D Pers Mat Update Persistemt Mem Size = 3616
[DSP1  ]    302.898554 s:  2D Pers Mat Update Scratch Mem Size    = 13336872
[DSP1  ]    302.939547 s: 2D_PERSMATUPDATE: Pers Mat Update for 2D started ..
[DSP1  ]    302.940675 s:  Camera 0 Perspective Parameters at beginning of process call:
[DSP1  ]    302.940736 s:  1314852-32788   2557763
[DSP1  ]    302.940736 s:  -16021 2063375  9386401
[DSP1  ]    302.940767 s:  -5263  -125     1048576
[DSP1  ]    302.940797 s:  Camera 1 Perspective Parameters at beginning of process call:
[DSP1  ]    302.940828 s:  1503554-31885   -21686232
[DSP1  ]    302.940858 s:  -85141 1019840  -77705260
[DSP1  ]    302.940889 s:  197    3502     1048576
[DSP1  ]    302.940919 s:  Camera 2 Perspective Parameters at beginning of process call:
[DSP1  ]    302.940950 s:  1000866-14245   -119653678
[DSP1  ]    302.940950 s:  -35992 1572343  -17862044
[DSP1  ]    302.940980 s:  4009   207      1048576
[DSP1  ]    302.941011 s:  Camera 3 Perspective Parameters at beginning of process call:
[DSP1  ]    302.941041 s:  1469887-6595    -45250582
[DSP1  ]    302.941072 s:  156147 1027641  53409666
[DSP1  ]    302.941102 s:  335    -3346    1048576
[DSP1  ]    304.788537 s: Number of features:
[DSP1  ]    304.788568 s: Reg0:11  8
[DSP1  ]    304.788598 s: Reg1:14  12
[DSP1  ]    304.788598 s: Reg2:8   12
[DSP1  ]    304.788629 s: Reg3:8   10
[DSP1  ]    304.788659 s: Number of matches:
[DSP1  ]    304.788659 s: Reg0:6   Reg1:7   Reg2:6   Reg3:7
[DSP1  ]    304.795705 s: #### SRV 2D PERS MAT UPDATE SUCCESSFUL ####
[DSP1  ]    304.795735 s:
[DSP1  ] Camera 0 calibration matrix mat used:
[DSP1  ]    304.795735 s:  1431514-33120   5072565
[DSP1  ]    304.795766 s:  -89666 2079993  6585728
[DSP1  ]    304.795796 s:  -5614  -145     1048576
[DSP1  ]    304.795827 s:  1710108 10829   -19993359
[DSP1  ]    304.795857 s:
[DSP1  ] Camera 1 calibration matrix mat used:
[DSP1  ]    304.795888 s:  1710108 10829   -19993359
[DSP1  ]    304.795888 s:  -95481 1059113  -90463985
[DSP1  ]    304.795918 s:  288    3800     1048576
[DSP1  ]    304.795949 s:  1086304-12891   -122144901
```

```
[DSP1  ]    304.795979 s:
[DSP1  ] Camera 2 calibration matrix mat used:
[DSP1  ]    304.796010 s:  1086304 -12891   -122144901
[DSP1  ]    304.796010 s:  -70231 1582107  -19620212
[DSP1  ]    304.796040 s:  4170   169      1048576
[DSP1  ]    304.796071 s:  1677858 -7992    -50651477
[DSP1  ]    304.796101 s:
[DSP1  ] Camera 3 calibration matrix mat used:
[DSP1  ]    304.796132 s:  1677858 -7992    -50651477
[DSP1  ]    304.796132 s:  165689 1056614  65072062
[DSP1  ]    304.796162 s:  346    -3492    1048576
[DSP1  ]    304.796193 s:  2113929100      -101975747       -249587762
[DSP1  ]    304.796223 s: 2D_PERSMATUPDATE: Pers Mat Update for 2D Done
[IPU1-0]    304.850881 s:  2D Pers Mat Update Success
[IPU1-0]    304.850972 s: SRV_CALIB_UC: ************************************
[IPU1-0]    304.851033 s: SRV_CALIB_UC: 3.Auto Calibration is completed   …
[IPU1-0]    304.851125 s: SRV_CALIB_UC: ************************************
[IPU1-0]    229.233392 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Chains Run-time Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Stop Chain
[IPU1-0]
[IPU1-0]  1: Auto Calibration
[IPU1-0]  2: Manual Calibration
[IPU1-0]  3: Default Calibration (Using Default Cal Mat)
[IPU1-0]
[IPU1-0]  4: Save Capture Frames for all channels to MMC/SD card
[IPU1-0]  5: Unmount File System before removing MMC/SD card
[IPU1-0]  6: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  7: Update 2D Pers Mat (after auto/manual calibration if required)
[IPU1-0]
[IPU1-0]  d: Save Display Frame to MMC/SD card
[IPU1-0]
[IPU1-0]
[IPU1-0]  p: Print Performance Statistics
```

7.4 Manual Calibration Selection

```
[IPU1-0]  ====================
[IPU1-0]  Chains Run-time Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Stop Chain
[IPU1-0]
[IPU1-0]  1: Auto Calibration
[IPU1-0]  2: Manual Calibration
[IPU1-0]  3: Default Calibration (Using Default Cal Mat)
[IPU1-0]
[IPU1-0]  4: Save Capture Frames for all channels to MMC/SD card
[IPU1-0]  5: Unmount File System before removing MMC/SD card
```

```
[IPU1-0]  6: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  7: Update 2D Pers Mat (after auto/manual calibration if required)
[IPU1-0]
[IPU1-0]  d: Save Display Frame to MMC/SD card
[IPU1-0]
[IPU1-0]
[IPU1-0]  p: Print Performance Statistics
[IPU1-0]
[IPU1-0]  Enter Choice: 2
[IPU1-0]
[IPU1-0]     31.869212 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Manual Calibration
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Exit
[IPU1-0]  1: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  2: Read the Calibration Matrix (CAL MAT) from file
[IPU1-0]  3: Compute LDC LUTs for 3D SRV (All view points)
[IPU1-0]  4: Unmount File System before removing MMC/SD card
[IPU1-0]  5: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  Enter Choice: 1
[IPU1-0]
[IPU1-0]     34.354663 s: SRV_CALIB_UC: Writing YUV image 0 to the file FRONT_0.YUV …
[IPU1-0]     41.008448 s: SRV_CALIB_UC: Writing YUV image 0 to the file FRONT_0.YUV DONE
[IPU1-0]     41.077228 s: SRV_CALIB_UC: Writing YUV image 1 to the file RIGHT_0.YUV …
[IPU1-0]     47.660281 s: SRV_CALIB_UC: Writing YUV image 1 to the file RIGHT_0.YUV DONE
[IPU1-0]     47.741322 s: SRV_CALIB_UC: Writing YUV image 2 to the file BACK_0.YUV …
[IPU1-0]     54.297505 s: SRV_CALIB_UC: Writing YUV image 2 to the file BACK_0.YUV DONE
[IPU1-0]     54.367046 s: SRV_CALIB_UC: Writing YUV image 3 to the file LEFT_0.YUV …
[IPU1-0]     60.970749 s: SRV_CALIB_UC: Writing YUV image 3 to the file LEFT_0.YUV DONE
[IPU1-0]     60.970932 s: SRV_CALIB_UC: Writing YUV image is completed
[IPU1-0]     60.971054 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Manual Calibration
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Exit
[IPU1-0]  1: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  2: Read the Calibration Matrix (CAL MAT) from file
[IPU1-0]  3: Compute LDC LUTs for 3D SRV (All view points)
[IPU1-0]  4: Unmount File System before removing MMC/SD card
[IPU1-0]  5: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  Enter Choice: 4
[IPU1-0]
[IPU1-0]     65.601933 s: SRV_CALIB_UC: File system Unmounted
[IPU1-0]     65.602025 s:
[IPU1-0]
```

```
[IPU1-0]  ====================
[IPU1-0]  Manual Calibration
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Exit
[IPU1-0]  1: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  2: Read the Calibration Matrix (CAL MAT) from file
[IPU1-0]  3: Compute LDC LUTs for 3D SRV (All view points)
[IPU1-0]  4: Unmount File System before removing MMC/SD card
[IPU1-0]  5: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  Enter Choice: 5
[IPU1-0]
[IPU1-0]     76.110504 s: SRV_CALIB_UC: File System Mounted
[IPU1-0]     76.239461 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Manual Calibration
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Exit
[IPU1-0]  1: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  2: Read the Calibration Matrix (CAL MAT) from file
[IPU1-0]  3: Compute LDC LUTs for 3D SRV (All view points)
[IPU1-0]  4: Unmount File System before removing MMC/SD card
[IPU1-0]  5: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  Enter Choice: 2
[IPU1-0]
[IPU1-0]     79.326511 s: SRV_CALIB_UC: => Reading Cal Mat from CALMAT.BIN file …
[IPU1-0]     79.329195 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Manual Calibration
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Exit
[IPU1-0]  1: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  2: Read the Calibration Matrix (CAL MAT) from file
[IPU1-0]  3: Compute LDC LUTs for 3D SRV (All view points)
[IPU1-0]  4: Unmount File System before removing MMC/SD card
[IPU1-0]  5: Mount File System after inserting MMC/SD card
[IPU1-0]
[IPU1-0]  Enter Choice: 3
[IPU1-0]
[IPU1-0]     91.634722 s: SRV_CALIB_UC: Reading V2W Mesh for view point 0 …
[IPU1-0]     91.721008 s: SRV_CALIB_UC: Generating LDC LUT for view point 0 …
[DSP1  ]     91.727078 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     91.873970 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     91.874367 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     91.874428 s: CarBoxCenter_x = 376, CarBoxCenter_y = 509
[DSP1  ]     91.874428 s: rotAngle = 0.000,rotAngleMod = 0.000,rotAngleRem = 0
[DSP1  ]     91.874489 s: seamAngle = 53.276
```

```
[DSP1  ]     91.874519 s: slopeAngle[0] = 53.276, slopeAngle[1] = 53.276
[DSP1  ]     91.874550 s: slopeAngle[2] = 53.276, slopeAngle[3] = 53.276
[DSP1  ]     91.874580 s: slope[0]      = 1.340, slope[1]      = 1.340
[DSP1  ]     91.874611 s: slope[2]      = 1.340, slope[3]      = 1.340
[DSP1  ]     91.874641 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]     91.874641 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]     91.874672 s: sv->seamMarkPts[0] = 6, sv->seamMarkPts[1] = 751
[DSP1  ]     91.874733 s: sv->seamMarkPts[2] = 1007, sv->seamMarkPts[3] = 747
[DSP1  ]     91.874763 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 5
[DSP1  ]     91.874794 s: sv->seamMarkPts[6] = 5, sv->seamMarkPts[7] = 0
[DSP1  ]     91.885194 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 752,H = 528
[DSP1  ]     91.885255 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 288,Y = 272,W = 176,H = 32
[DSP1  ]     91.885286 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 368,Y = 0,W = 384,H = 1008
[DSP1  ]     91.885316 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 0,Y = 496,W = 752,H = 512
[DSP1  ]     91.885377 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 384,H = 1008
[IPU1-0]     92.801195 s: SRV_CALIB_UC: Writing LDC LUT for view point 0 …
[DSP1  ]     92.800951 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]     94.823034 s: SRV_CALIB_UC: Reading V2W Mesh for view point 1 …
[IPU1-0]     94.912981 s: SRV_CALIB_UC: Generating LDC LUT for view point 1 …
[DSP1  ]     94.919203 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     95.066064 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     95.066461 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     95.066491 s: CarBoxCenter_x = 375, CarBoxCenter_y = 507
[DSP1  ]     95.066522 s: rotAngle = 6.002,rotAngleMod = 6.002,rotAngleRem = 0
[DSP1  ]     95.066552 s: seamAngle = 53.276
[DSP1  ]     95.066583 s: slopeAngle[0] = 59.278, slopeAngle[1] = 47.274
[DSP1  ]     95.066613 s: slopeAngle[2] = 59.278, slopeAngle[3] = 47.274
[DSP1  ]     95.066644 s: slope[0]      = 1.683, slope[1]      = 1.083
[DSP1  ]     95.066674 s: slope[2]      = 1.683, slope[3]      = 1.083
[DSP1  ]     95.066705 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]     95.066735 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]     95.066766 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 676
[DSP1  ]     95.066796 s: sv->seamMarkPts[2] = 914, sv->seamMarkPts[3] = 751
[DSP1  ]     95.066857 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 78
[DSP1  ]     95.066888 s: sv->seamMarkPts[6] = 100, sv->seamMarkPts[7] = 0
[DSP1  ]     95.076587 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 688,H = 528
[DSP1  ]     95.076648 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 256,Y = 272,W = 176,H = 48
[DSP1  ]     95.076709 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 928
[DSP1  ]     95.076740 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 64,Y = 496,W = 688,H = 512
[DSP1  ]     95.076770 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 80,W = 384,H = 928
[IPU1-0]     95.991703 s: SRV_CALIB_UC: Writing LDC LUT for view point 1 …
[DSP1  ]     95.991490 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]     97.839108 s: SRV_CALIB_UC: Reading V2W Mesh for view point 2 …
[IPU1-0]     97.932928 s: SRV_CALIB_UC: Generating LDC LUT for view point 2 …
[DSP1  ]     97.939150 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]     98.085951 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]     98.086347 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]     98.086378 s: CarBoxCenter_x = 374, CarBoxCenter_y = 506
[DSP1  ]     98.086408 s: rotAngle = 12.005,rotAngleMod = 12.005,rotAngleRem = 0
[DSP1  ]     98.086469 s: seamAngle = 53.276
[DSP1  ]     98.086469 s: slopeAngle[0] = 65.280, slopeAngle[1] = 41.271
[DSP1  ]     98.086500 s: slopeAngle[2] = 65.280, slopeAngle[3] = 41.271
[DSP1  ]     98.086530 s: slope[0]      = 2.172, slope[1]      = 0.878
[DSP1  ]     98.086561 s: slope[2]      = 2.172, slope[3]      = 0.878
```

```
[DSP1  ]     98.086591 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]     98.086622 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]     98.086652 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 606
[DSP1  ]     98.086683 s: sv->seamMarkPts[2] = 836, sv->seamMarkPts[3] = 751
[DSP1  ]     98.086713 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 144
[DSP1  ]     98.086744 s: sv->seamMarkPts[6] = 177, sv->seamMarkPts[7] = 0
[DSP1  ]     98.095650 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 624,H = 528
[DSP1  ]     98.095711 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 240,Y = 272,W = 128,H = 64
[DSP1  ]     98.095742 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 848
[DSP1  ]     98.095772 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 128,Y = 496,W = 624,H = 512
[DSP1  ]     98.095833 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 160,W = 384,H = 848
[IPU1-0]     99.009424 s: SRV_CALIB_UC: Writing LDC LUT for view point 2 …
[DSP1  ]     99.009241 s: BLEND_TABLE: Generating Blend Table DONE
.
.
.
[IPU1-0]    300.481302 s: SRV_CALIB_UC: Reading V2W Mesh for view point 89 …
[IPU1-0]    300.575062 s: SRV_CALIB_UC: Generating LDC LUT for view point 89 …
[DSP1  ]    300.581010 s: LDC_LUT: Generating LDC LUT …
[DSP1  ]    300.727871 s: LDC_LUT: Generating LDC LUT DONE
[DSP1  ]    300.728268 s: BLEND_TABLE: Generating Blend table …
[DSP1  ]    300.728298 s: CarBoxCenter_x = 375, CarBoxCenter_y = 508
[DSP1  ]    300.728329 s: rotAngle = 6.002,rotAngleMod = 6.002,rotAngleRem = 0
[DSP1  ]    300.728390 s: seamAngle = 53.276
[DSP1  ]    300.728420 s: slopeAngle[0] = 59.278, slopeAngle[1] = 47.274
[DSP1  ]    300.728451 s: slopeAngle[2] = 59.278, slopeAngle[3] = 47.274
[DSP1  ]    300.728481 s: slope[0]      = 1.683, slope[1]      = 1.083
[DSP1  ]    300.728512 s: slope[2]      = 1.683, slope[3]      = 1.083
[DSP1  ]    300.728542 s: chMap[0]      = 0, chMap[1]         = 1
[DSP1  ]    300.728573 s: chMap[2]      = 2, chMap[3]         = 3
[DSP1  ]    300.728603 s: sv->seamMarkPts[0] = 0, sv->seamMarkPts[1] = 676
[DSP1  ]    300.728634 s: sv->seamMarkPts[2] = 915, sv->seamMarkPts[3] = 751
[DSP1  ]    300.728664 s: sv->seamMarkPts[4] = 1007, sv->seamMarkPts[5] = 79
[DSP1  ]    300.728695 s: sv->seamMarkPts[6] = 101, sv->seamMarkPts[7] = 0
[DSP1  ]    300.738455 s: Cam 0: Slice 0: BW = 16, BH = 16, X = 0,Y = 0,W = 688,H = 528
[DSP1  ]    300.738485 s: Cam 0: Slice 1: BW = 16, BH = 8, X = 256,Y = 272,W = 176,H = 48
[DSP1  ]    300.738546 s: Cam 1: Slice 0: BW = 16, BH = 16, X = 352,Y = 0,W = 400,H = 928
[DSP1  ]    300.738577 s: Cam 2: Slice 0: BW = 16, BH = 16, X = 64,Y = 496,W = 688,H = 512
[DSP1  ]    300.738638 s: Cam 3: Slice 0: BW = 16, BH = 16, X = 0,Y = 80,W = 384,H = 928
[IPU1-0]    301.653510 s: SRV_CALIB_UC: Writing LDC LUT for view point 89 …
[DSP1  ]    301.653297 s: BLEND_TABLE: Generating Blend Table DONE
[IPU1-0]    302.716189 s: SRV_CALIB_UC: Time taken to write 90 view point data = 211075 msec
```

7.5 Surround View Use Case selection

Ensure to re-select the camera, refer section 7.1

```
[IPU1-0]  Vision SDK Usecases,
[IPU1-0]  --------------------
```

```
[IPU1-0]  1: Single Camera Usecases
[IPU1-0]  2: Multi-Camera LVDS Usecases
[IPU1-0]  3: AVB RX Usecases, (TDA2x & TDA2Ex ONLY)
[IPU1-0]  4: Dual Display Usecases, (TDA2x EVM ONLY)
[IPU1-0]  5: ISS Usecases, (TDA3x ONLY)
[IPU1-0]  6: xCAM Usecases
[IPU1-0]  a: Miscellaneous test's
[IPU1-0]
[IPU1-0]  s: System Settings
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 5
[IPU1-0]
[IPU1-0]     11.511773 s:
[IPU1-0]     11.511864 s:
[IPU1-0]
[IPU1-0]  ISS Usecases (TDA3x ONLY)
[IPU1-0]  ---------------------------
[IPU1-0]  1: 1CH ISS capture + ISS ISP + ISS LDC+VTNF + Display
[IPU1-0]  2: 4CH ISS capture + ISS ISP + Simcop + Surround View (DSP1) +  Display
[IPU1-0]  3: 1CH ISS capture (AR0132) + ISS ISP Monochrome +  Display
[IPU1-0]  4: 3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display
[IPU1-0]  5: Surround View Calibration
[IPU1-0]  6: 3D + 2D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display
[IPU1-0]  7: 3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + RearView + Display
[IPU1-0]
[IPU1-0]  x: Exit
[IPU1-0]
[IPU1-0]  Enter Choice: 4
[IPU1-0]
[IPU1-0]     12.073506 s:
[IPU1-0]     10.284847 s:  CHAINS: Initiating read of LDC Look Up Tables from MMC/SD
[IPU1-0]     10.301897 s:  *** UTILS: CPU KHz = 20000 Khz ***
[IPU1-0]     10.302019 s:  SRV_MEDIA: Reading LDC LUT for view point 0 …
[IPU1-0]     10.672787 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x40
[IPU1-0]     10.674159 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x42
[IPU1-0]     10.675349 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x44
[IPU1-0]     10.676538 s:  ISS_SENSOR: INST0 : I2C1 : I2C Addr = 0x46
[IPU1-0]     10.717531 s:  ISSCAPTURE: Create in progress !!!
[IPU1-0]     11.025803 s:  UTILS: DMA: Allocated CH (TCC) = 48 (48)
[IPU1-0]     11.025925 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 48 (0x63304800)
[IPU1-0]     11.026200 s:  ISSCAPTURE: Create Done !!!
[IPU1-0]     11.026413 s:  ISSM2MISP: Create in progress !!!
[IPU1-0]     11.663392 s:  UTILS: DMA: Allocated CH (TCC) = 49 (49)
[IPU1-0]     11.663484 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 49 (0x63304820)
[IPU1-0]     11.675593 s:  ISSM2MISP: Create Done !!!
[IPU1-0]     11.675928 s:  ALGORITHM: Create in progress (algId = 3) !!!
[IPU1-0]     11.733666 s:  ALGORITHM: Create Done (algId = 3) !!!
[IPU1-0]     11.734124 s:  ALGORITHM: Create in progress (algId = 7) !!!
[IPU1-0]     11.973738 s:  UTILS: DMA: Allocated CH (TCC) = 50 (50)
[IPU1-0]     11.973860 s:  UTILS: DMA: 0 of 1: Allocated PaRAM = 50 (0x63304840)
[IPU1-0]     11.977612 s:  ALGORITHM: Create Done (algId = 7) !!!
[IPU1-0]     11.977764 s:  IPC_OUT_0   : Create in progress !!!
```

```
[IPU1-0]     11.978069 s:  IPC_OUT_0   : Create Done !!!
[IPU1-0]     11.979472 s:  IPC_OUT_1   : Create in progress !!!
[IPU1-0]     11.979747 s:  IPC_OUT_1   : Create Done !!!
[IPU1-0]     11.980997 s:  IPC_IN_0   : Create in progress !!!
[IPU1-0]     11.981852 s:  IPC_IN_0   : Create Done !!!
[IPU1-0]     11.981974 s:  DISPLAY: Create in progress !!!
[IPU1-0]     11.982553 s:  DISPLAY: Create Done !!!
[IPU1-0]     11.984627 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[IPU1-0]     11.984780 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 151392 B (147 KB)
[IPU1-0]     11.984932 s:  SYSTEM: Heap = SR_OCMC               @ 0x00000000, Total size = 0 B (0
KB), Free size = 0 B (0 KB)
[IPU1-0]     11.985207 s:  SYSTEM: Heap = SR_DDR_CACHED        @ 0x85483000, Total size = 367001600
B (350 MB), Free size = 295244288 B (281 MB)
[IPU1-0]     11.985390 s:  SYSTEM: Heap = SR_DDR_NON_CACHED    @ 0xbfe00000, Total size = 1048832 B
(1 MB), Free size = 1041152 B (0 MB)
[IPU1-0]     11.997803 s:  DSP Create done
[IPU1-0]     12.000549 s:  QSPI Read Started, please wait!
[IPU1-0]     12.000732 s:  QSPI Read Completed Sucessfully
[IPU1-0]     12.000793 s:  CHAINS: DCC Tag ID check failed for QSPI
[IPU1-0]     12.000854 s:  CHAINS: Using DCC Profile from Driver
[IPU1-0]     12.017354 s:  ********** LDC Optimization **************
[IPU1-0]     12.017446 s:  gLdcRdMaxTagCnt   = 15
[IPU1-0]     12.017507 s:  gLdcTrafficOnNrt1 = 0
[IPU1-0]     12.017568 s:  gIspTrafficOnNrt2 = 1
[IPU1-0]     12.017629 s:  gUseOcmcLdcLut    = 1
[IPU1-0]     12.017659 s:  gLdcSlicePrmNo    = 6
[IPU1-0]     12.017720 s:  gLdcPixelPad      = 2
[IPU1-0]     12.017781 s:  lumeIntrType(0:bicubic,1:bilinear) = 1
[IPU1-0]     12.017842 s:  ******************************************
[IPU1-0]     12.018330 s:  Dewarp Task Priority = 2
[IPU1-1]     11.997986 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[IPU1-1]     11.998139 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 255424 B (249 KB)
[DSP1  ]     11.978283 s:  IPC_IN_0   : Create in progress !!!
[DSP1  ]     11.978649 s:  IPC_IN_0   : Create Done !!!
[DSP1  ]     11.979899 s:  IPC_IN_1   : Create in progress !!!
[DSP1  ]     11.980296 s:  IPC_IN_1   : Create Done !!!
[DSP1  ]     11.980448 s:  ALGORITHM: Create in progress (algId = 3) !!!
[DSP1  ]     11.980692 s:  ALGORITHM: Create Done (algId = 3) !!!
[DSP1  ]     11.980845 s:  IPC_OUT_0   : Create in progress !!!
[DSP1  ]     11.980906 s:  IPC_OUT_0   : Create Done !!!
[DSP1  ]     11.982736 s:  ALGORITHM: Create in progress (algId = 6) !!!
[DSP1  ]     11.984475 s:  ALGORITHM: Create Done (algId = 6) !!!
[DSP1  ]     11.998444 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[DSP1  ]     11.998505 s:  SYSTEM: Heap = LOCAL_L2             @ 0x00800000, Total size = 227264 B
(221 KB), Free size = 96192 B (93 KB)
[DSP1  ]     11.998566 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 524288 B
(512 KB), Free size = 519504 B (507 KB)
[DSP2  ]     11.998688 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[DSP2  ]     11.998749 s:  SYSTEM: Heap = LOCAL_L2             @ 0x00800000, Total size = 227264 B
(221 KB), Free size = 227264 B (221 KB)
[DSP2  ]     11.998810 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 524288 B
(512 KB), Free size = 519504 B (507 KB)
[EVE1  ]     11.999054 s:  SYSTEM: SW Message Box Msg Pool, Free Msg Count = 1023
[EVE1  ]     11.999359 s:  SYSTEM: Heap = LOCAL_L2              @ 0x40020000, Total size = 24576 B
(24 KB), Free size = 24576 B (24 KB)
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[EVE1  ]      11.999877 s:  SYSTEM: Heap = LOCAL_DDR            @ 0x00000000, Total size = 262144 B
(256 KB), Free size = 257448 B (251 KB)
[IPU1-0]     12.557158 s:  ISS_SENSOR: VIP 42: DRV ID 120f (I2C ADDR 0x40): a640:00b4:0000
[IPU1-0]     12.559080 s:  ISS_SENSOR: VIP 43: DRV ID 120f (I2C ADDR 0x42): a640:00b4:0000
[IPU1-0]     12.561062 s:  ISS_SENSOR: VIP 44: DRV ID 120f (I2C ADDR 0x44): a640:00b4:0000
[IPU1-0]     12.563045 s:  ISS_SENSOR: VIP 45: DRV ID 120f (I2C ADDR 0x46): a640:00b4:0000
[IPU1-0]     12.563197 s:  Sensor Config time = 545 msec
[IPU1-0]          12.568535  s:    HDMI_TX:  hdmiId.deviceId  =  176,hdmiId.deviceProdRevId  =  2,
hdmiId.hdcpRevTpi = 0, hdmiId.tpiRevId = 3
[IPU1-0]          12.568870  s:    HDMI_TX:    hpdPrms.busError  =  2,  hpdPrms.hpdEvtPending  =  0,
hpdPrms.hpdStatus = 4
[IPU1-0]     12.577868 s:  DISPLAY: Start in progress !!!
[IPU1-0]     12.577960 s:  DISPLAY: Start Done !!!
[IPU1-0]     12.578570 s:  ISSCAPTURE: Start in progress !!!
[IPU1-0]     12.578783 s:  ISSCAPTURE: Start Done !!!
[IPU1-0]     12.596626 s:  GRPXSRC: Create in progress !!!
[IPU1-0]     14.332458 s:  SRV_MEDIA: Reading LDC LUT for view point 5 …
[IPU1-0]     16.551546 s:  SRV_MEDIA: Reading LDC LUT for view point 10 …
[IPU1-0]     18.717226 s:  SRV_MEDIA: Reading LDC LUT for view point 15 …
[IPU1-0]     20.844628 s:  SRV_MEDIA: Reading LDC LUT for view point 20 …
[IPU1-0]     22.586469 s:  GRPXSRC: Create Done !!!
[IPU1-0]     22.586805 s:  DISPLAY: Create in progress !!!
[IPU1-0]     22.587964 s:  DISPLAY: Create Done !!!
[IPU1-0]     22.588391 s:  DISPLAY: Start in progress !!!
[IPU1-0]     22.588482 s:  DISPLAY: Start Done !!!
[IPU1-0]     20.481455 s:
[IPU1-0]
[IPU1-0]  ====================
[IPU1-0]  Chains Run-time Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  0: Stop Chain
[IPU1-0]  1: Save a Captured RAW frame from channel 0 (Will be saved in DDR)
[IPU1-0]  2: Save a DeWarp Output Frame (Will be saved in DDR)
[IPU1-0]  3: Save ISP output frames (Will be saved in MMC/SD : All channels)
[IPU1-0]  s: Stop / Start Transitions
[IPU1-0]  n: Change to Next View Point, after transitions are stopped
[IPU1-0]  r: Change to Previous View Point, after transitions are stopped
[IPU1-0]
[IPU1-0]  d: Save Display Frame to MMC/SD card
[IPU1-0]
[IPU1-0]
[IPU1-0]  p: Print Performance Statistics
[IPU1-0]
[IPU1-0]  Enter Choice:
[IPU1-0]
[IPU1-0]     23.054230 s:  SRV_MEDIA: Reading LDC LUT for view point 25 …
[IPU1-0]     25.245440 s:  SRV_MEDIA: Reading LDC LUT for view point 30 …
[IPU1-0]     27.407246 s:  SRV_MEDIA: Reading LDC LUT for view point 35 …
[IPU1-0]     29.563838 s:  SRV_MEDIA: Reading LDC LUT for view point 40 …
[IPU1-0]     31.700878 s:  SRV_MEDIA: Reading LDC LUT for view point 45 …
[IPU1-0]     33.848868 s:  SRV_MEDIA: Reading LDC LUT for view point 50 …
[IPU1-0]     35.972640 s:  SRV_MEDIA: Reading LDC LUT for view point 55 …
[IPU1-0]     38.078997 s:  SRV_MEDIA: Reading LDC LUT for view point 60 …
[IPU1-0]     40.224425 s:  SRV_MEDIA: Reading LDC LUT for view point 65 …
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[IPU1-0]     42.458549 s:  SRV_MEDIA: Reading LDC LUT for view point 70 …
[IPU1-0]     44.657689 s:  SRV_MEDIA: Reading LDC LUT for view point 75 …
[IPU1-0]     46.836637 s:  SRV_MEDIA: Reading LDC LUT for view point 80 …
[IPU1-0]     49.049289 s:  SRV_MEDIA: Reading LDC LUT for view point 85 …
[IPU1-0]     51.223205 s:  SRV_MEDIA: Time taken to read 90 view point data = 40921 msec
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8 Revision History

Version	Date	Revision History
0.1	1st March 2016	Draft
0.2	11th March 2016	Updated for 2.9 Release
0.3	6th July 2016	Updated for 2.10 Release
0.4	27th January 2017	Updated for 2.12 Release
0.5	29th June 2017	Updated for 3.0 Release
0.6	16th October 2017	Updated for 3.1 Release
0.7	28th November 2017	Updated for 3.2 Release

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